| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 1 **Lesson Plan:** 1

**Unit Name:** N/A **Topic:** Introduction **Date:** _____

## Objective(s):

**At the end of this period, the students will be able to:**

Introduce themselves, get familiar with their fellows and learn about the rules of the classroom.

## Resource Material:

Chalk/Marker, White/Blackboard, Wallchart of classroom rules, name tags, markers, blank sheets, Classroom Rules poster or handout

## Teaching & Learning Activities:

### Opening Activities/Warm-up: (5 min)

Say, “Assalaamu Alaikum” and start with the name of Allah.
Ask the students: How are you? Encourage them to say, “Alhamdulillah”.
Start with ‘Bismillah’ and tell them to recite it before starting any work.
Begin by introducing yourself to the class and telling them a little bit about yourself.
Explain that today’s lesson is all about getting to know each other and learning the rules of the classroom.

### Main Activities/Concept Building: (25 min)

**Activity 1:**

Hand out name tags and markers to each student.
Instruct students to write their name on the name tag and decorate it however they like.
Once everyone has finished, have students put on their name tags.

**Activity 2:**

Hand out a sheet of paper and a pencil to each student. Instruct students to write down five things about themselves that they think are unique or interesting. Once everyone has finished, have students stand up and walk around the room. The goal is for students to find someone who has something in common with them or who has done something they find interesting.

**Activity 3:**

Bring the class back together. Ask students what they think are some important rules for the classroom. Write down their suggestions on the whiteboard. Display the "Classroom Rules" poster or handout. Discuss each rule with the class, providing examples of why the rule is important and what could happen if the rule is not followed. Ask the students to brainstorm consequences for breaking each rule.

### Sum Up: (3 min)

Sum up the lesson by reminding students that it’s important to get to know each other, make new friends and follow the rules of the classroom. Encourage students to continue getting to know their classmates and following the classroom rules throughout the school year.

### Assessment: (5 min)

Ask each student to name one or two of their classmates and share what they learned about them.
Observe how comfortable they are interacting with others and how well they remember their classmates' information..

### Homework: (2 min)

Write a short paragraph introducing yourself.
Recall the classroom rules that were discussed during the lesson and come up with one additional rule that you think would be important to have in the classroom

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

# Classroom Rules

**Be respectful:** Treat others with kindness and respect at all times.

**Listen carefully:** Pay attention when the teacher or a classmate is speaking.

**Raise your hand:** Raise your hand and wait to be called on before speaking.

**Stay on task:** Stay focused and work on the task at hand.

**Be prepared:** Come to class with all the materials you need and be ready to learn.

**Follow directions:** Listen to and follow the teacher's instructions.

**Work quietly:** Keep noise levels low so that everyone can concentrate.

**Keep the classroom tidy:** Clean up after yourself and help keep the classroom neat and organized.

**Be honest:** Always tell the truth and take responsibility for your actions.

**Be a good fellow:** Work well with others and be willing to help your classmates.

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 1 **Lesson Plan:** 2

**Unit Name:** Real Numbers **Topic:** Terminating and Non-Terminating Decimal **Date**: _____

## Objective(s):

### At the end of this period, the students will be able to:

Identify and differentiate between decimal numbers as terminating and non-terminating.

### Resource Material:

Chalk/Marker, White/Blackboard, textbook page 1, 2, 3, 6

## Teaching & Learning Activities:

### Opening Activities/Warm-up: (7 min)

Say, “Assalaamu Alaikum” and start with the name of Allah.
Ask the students: How are you? Encourage them to say, “Alhamdulillah”. Start with ‘Bismillah’ and tell them to recite it before starting any work.
Have students open textbook at page 1. Quickly recall the concepts related to questions given in rapid recall. Then ask them to solve those question. Read the opening page question and tell them that we will be able to solve it after learning about the concepts of the unit.
(***Note for teachers:*** *The sections “Think out of the box”, “Talk over and write” and “Technology corner” are supplementary exercises. These can also be given to students who finish their work quickly or are fast learners.)*

### Main Activities/Concept Building: (25 min)

Before the main concept, tell them briefly about the unit outline and its real life relevance. Have students open textbook at page 2. Begin by asking the students what decimal numbers are and what they represent. Discuss the concept of decimal numbers and their place value. Introduce the terms "terminating" and "non-terminating" and explain that they refer to the way a decimal number is written. Write “Terminating Decimals” on the board. Tell them that when converting a fraction to a decimal using the division method, we mostly notice that the division is complete after certain steps and we get the remainder of zero. In such cases, the quotient obtained as a decimal is called the terminating decimal. Write 43/5 on the board(worked example on page 2). Ask students how can we divide it? Take their responses. Solve it on the board and explain each step as given in the textbook. As you get the answer 8.6, ask students how many digits are there after the decimal point? Take responses. Tell them that there is one digit after the decimal point in the quotient 8.6. Tell them that this decimal is terminating decimal. Explain that the terminating decimal numbers are those decimal numbers that have a finite number of digits after the decimal point. Write and elaborate a few more examples of terminating decimals from book page 2. Ask them to move to page 3. Next write “Non-Terminating Decimals” on the board. Tell them that when converting a fraction to a decimal by the division method, the division process does not end and we do not get a remainder equal to zero. In such a case, the obtained decimal as a quotient is called the non-terminating decimal. Write 22/7 on the board(worked example on page 3). Ask students how can we divide it? Take their responses. Solve it on the board and explain each step as given in the textbook. As you get the answer 3.142…, ask students how many digits are there after the decimal point? Take responses. Tell them that if we keep dividing, there will be infinite digits after the decimal point in the quotient. Tell them that this decimal is non-terminating decimal, as the division process doesn’t end and there are unlimited digits after decimal point in the quotient. Write and elaborate a few more examples of non-terminating decimals from book page 3.

### Activity:

Instruct students to open their textbook page 6 and solve Q1(first 3 parts) of “Learning check 1.1” . Walk around the class and guide them if necessary.

### Sum Up: (2 min)

Sum up the lesson by re-telling students about terminating and non-terminating decimal numbers.

### Assessment: (5 min)

To assess students ask them to solve Q1(14/23) of “Learning check 1.1” given at page 6.

### Homework: (1 min)

Solve Q1(last 5 parts) of “Learning check 1.1”at page 6 of their textbook.

**Teacher’s Self-Evaluation:** **Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:** _____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 1 **Lesson Plan:** 3

**Unit Name:** Real Numbers **Topic:** Recurring and Non-recurring Decimals **Date:** _____

## Objective(s):

### At the end of this period, the students will be able to:

Identify and differentiate between recurring and non-recurring decimals.

### Resource Material:

Chalk/Marker, White/Blackboard, textbook page 3, 4, 5, 6

## Teaching & Learning Activities:

### Opening Activities/Warm-up: (5 min)

Say, “Assalaamu Alaikum” and start with the name of Allah.
Ask the students: How are you? Encourage them to say, “Alhamdulillah”. Start with ‘Bismillah’ and tell them to recite it before starting any work.
Begin the lesson by asking students about their homework. Write a few terminating and non-terminating decimals on the board. Ask them to observe and identify which ones are terminating and which are non-terminating. As they answer, ask them to tell the reason. Take responses and appreciate them for their efforts.

### Main Activities/Concept Building: (25 min)

Have students open textbook at page 3. After reviewing the concept of terminating and non-terminating decimals, which were covered in previous lesson, tell them that a there are two further types of non-terminating decimals, "recurring" and "non-recurring" decimals. Ask students if they have ever encountered a decimal that goes on forever without repeating and if they know how to write such a number. Introduce the terms "recurring" and "non-recurring" decimals and explain that they refer to the way a non-terminating decimal is written. . Write “Repeating or Recurring Decimals” on the board. Tell them that when converting a fraction to a decimal using the division method, we sometimes notice that a single digit or a block of digits that repeats itself an infinite number of times after the decimal point. Such decimals are called repeating or recurring decimal number. Have them open textbook page 4. Write 4/9 on the board(worked example on page 4). Ask students how can we divide it? Take their responses. Solve it on the board and explain each step as given in the textbook. As you get the answer 0.444…, ask students how many digits are there after the decimal point? Take responses. Tell them that the division process continues infinitely and we cannot get the remainder of zero. So, 4/9 = 0.444… Hence it is a repeating or recurring decimal number as the number 4 is infinitely repeated. Write and elaborate a few more examples of terminating decimals from book page 4. In a similar way, explain non-recurring decimals. Tell them that a non-terminating decimal number that continues endlessly with no digit or block of digits repeating is called a non-recurring decimal number. Elaborate the example on page 4 “17/13” and step by step divide it. Tell them that in the quotient 1.307…. the division process is not complete with a remainder of zero, and in the quotient the digits after the decimal point are not repeating themselves. So, these are non-recurring decimal numbers. After that, explain the “note to remember” given on page 4 about how to represent a repeating or recurring decimal.

**Activity:**

Instruct students to open their textbook page 6 and solve Q2(a, b, c) and Q3(a, b, c) of “Learning check 1.1”. Walk around the class and guide them if necessary.

### Sum Up: (3 min)

Sum up the lesson by re-telling students how to differentiate between recurring and non-recurring decimals.

### Assessment: (5 min)

To assess students ask them to solve Q2(d) and Q3(d) of “Learning check 1.1”. given at page 6.

### Homework: (2 min)

Solve Q2(e to o), Q3(e to l) and Q4 of “Learning check 1.1”at page 6 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 1 **Lesson Plan:** 4

**Unit Name:** Real Numbers **Topic:** Real-World Problems **Date:** _____

## Objective(s):

### At the end of this period, the students will be able to:

Solve real-world word problems involving calculation with decimals and fractions.

### Resource Material:

Chalk/Marker, White/Blackboard, textbook page 5-7

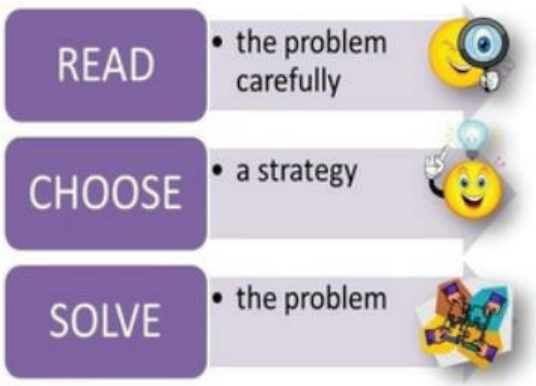
## Teaching & Learning Activities:

### Opening Activities/Warm-up: (5 min)

Say, “Assalaam u Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Begin the lesson by asking students about their homework. Ask them if anyone can create a real-life situation involving decimals or fractions. Take their responses and have them explain the real-life situation. Ask them how will they solve it? Take responses and appreciate their effort.

**Main Activities/Concept Building: (25 mins)**

Ask students to open textbook page 5. Begin the lesson by telling them that solving real word problems involving decimals or fractions is same as real life problems of whole numbers. Encourage students that whenever they have to solve a word problem, read the problem carefully. Then underline or highlight key information in the problem, and then identify what they are being asked to solve. Ask them to look for keywords or phrases that indicate which operation is needed to solve the problem. Next ask them to look at the relationship between the numbers in the problem. Encourage students to draw a picture or diagram to help them visualize the problem and identify the operation. Demonstrate the method step by step(given above) by reading, explaining and solving the worked examples 1 and 2 given on page 5 involving fractions. Tell the students that if the problem involves mixed fractions, convert it to improper fractions. Then find a common denominator and finally perform the required operation. At last simplify the result if possible. Similarly explain the method of solving problems involving decimals by elaborating worked examples 3 and 4 given on page 5 and 6 of textbook. Tell them to convert decimals to fractions for making the calculation easier(if required). Encourage the students to ask questions if they need more explanation.




**Activity:**

Ask students to open textbook page 7. Have them solve Q5 of learning check 1.1. Walk around the class and monitor their work. Guide them if necessary.

**Sum Up: (3 min)**

Sum up the lecture by repeating the step-by-step strategy to understand and solve the word problem related to fractions and decimals numbers.

**Assessment: (5 min)**

To assess students ask them to solve Q6 of learning check 1.1. given at page 7.

**Homework: (2 min)**

Solve Q 7, 8, 9 of learning check 1.1. of “Learning check 1.1”at page 7 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 1 **Lesson Plan:** 5

**Unit Name:** Real Numbers **Topic:** Rational and Irrational Numbers **Date:** _____

## Objective(s):

### At the end of this period, the students will be able to:

Identify rational and irrational numbers.

### Resource Material:

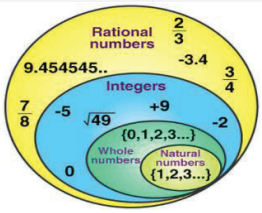
Chalk/Marker, White/Blackboard, textbook page 7, 8, 10

## Teaching & Learning Activities:

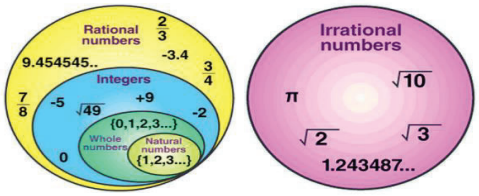
### Opening Activities/Warm-up: (5 min)

Say, "Assalaam u Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Begin the lesson by asking students about their homework. Ask them if they can recall what rational numbers are. Take their responses. Ask them randomly to give some examples of rational numbers. Write them on the board and let the student explain why they are rational.

### Main Activities/Concept Building: (25 mins)




Ask students to open textbook page 7. Begin the lesson by drawing a Venn diagram showing the relationship of various sets. Explain that natural numbers and 0 make up the set of whole numbers. The set of whole numbers, along with the negative numbers, make the set of integers. Integers, along with fractions and decimals, make up the set of rational numbers. Review by asking them to tell the definition of rational numbers. Tale their responses. A rational number is a positive or negative number that can be represented as a fraction or quotient of two integers. In general, we express rational numbers in the form of p/q, where p and q are integers, and q≠0. Ask them to observe the examples of rational numbers given in the Venn diagram and in the textbook.




After this, explain that all numbers that are not rational, are called irrational numbers. Tell them that an irrational number is any number that cannot be expressed as a fraction or in p/q form, where p and q are integers, and q≠0. Now draw the set of irrational numbers in the Venn diagram and explain various examples using it and by using the examples of irrational numbers given on page 8. Using table given on page 8, provide examples of various rational and irrational numbers. Encourage the students to ask questions if they need more explanation.

**Activity:**

Have students work in pairs. Write some rational and irrational numbers on the board. Ask students to explain why these numbers are irrational.

### Sum Up: (3 min)

Sum up the lecture by repeating the definition of rational and irrational numbers and provide some examples.

### Assessment: (5 min)

To assess students ask them to write 3 examples of rational and irrational numbers each.

### Homework: (2 min)

Solve Q1(a, b) of Learning check 1.2 given on page 10 of textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 1 **Lesson Plan:** 6

**Unit Name:** Real Numbers **Topic:** Rational and Irrational Numbers **Date**: _____

## Objective(s):

### At the end of this period, the students will be able to:

Differentiate between rational and irrational numbers.

### Resource Material:

Chalk/Marker, White/Blackboard, textbook page 7, 8, 10, sorting sheet

## Teaching & Learning Activities:

### Opening Activities/Warm-up: (5 min)

Say, “Assalaam u Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Begin the lesson by asking students about their homework. Ask them to raise hands and define rational numbers. Again, ask them to raise hands and define irrational numbers. Take responses and appreciate their efforts.

**Main Activities/Concept Building: (25 mins)**

**Activity 1:**

After reviewing the definition of rational and irrational numbers, divide the students into small groups. Distribute sorting sheets having two columns (rational and irrational) to each group. Write multiple rational and irrational numbers on the board(a few examples are provided in resources) . Each group must work together to sort the written numbers into the correct column on the sorting sheet based on whether they are rational or irrational. Encourage students to discuss their reasoning and strategies with each other. Once all of the cards have been sorted, the groups can check their answers with the teacher or with another group. The group with the most correct answers wins the game.

**Activity 2:**

Ask students to solve Q1(a, b, c, d) of Learning check 1.2 given on page 10 of textbook. Walk around the class and monitor their work. Guide them if necessary.

**Sum Up: (3 min)**

Sum up the lecture by repeating the definition of rational and irrational numbers and provide some examples.

**Assessment: (5 min)**

To assess students ask them to solve “pause and Try” given at page 8 of textbook.

**Homework: (2 min)**

Solve Q1(e to k) of Learning check 1.2 given on page 10 of textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

# Examples of Numbers

| | | | | | | |
|---|---|---|---|---|---|---|
| 0.8 | -3/10 | √40 | √81 | 2 1/3 | 0.35 | 0.33333… |
| -9 | 3.4 | √2 | √100 | 2/5 | -2/3 | 0.35217534… |

# Sorting Sheet

| Rational Numbers | Irrational Numbers |
|---|---|
| | |

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 1 **Lesson Plan:** 7

**Unit Name:** Real Numbers **Topic:** Real Numbers **Date:** _____

## Objective(s):

### At the end of this period, the students will be able to:

Identify real numbers and their absolute value.

### Resource Material:

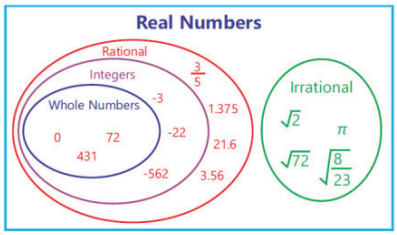
Chalk/Marker, White/Blackboard, textbook page 8, 9, 10/11

## Teaching & Learning Activities:

### Opening Activities/Warm-up: (5 min)

Say, "Assalaam u Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Begin the lesson by asking students about their homework. Ask them to write 3 examples of rational and irrational numbers each on their notebooks. Then ask them to verbally differentiate between them. Take responses and appreciate their efforts.

### Main Activities/Concept Building: (25 mins)




Ask students to open textbook page 8. Begin the lesson by drawing a Venn diagram showing the rational and irrational number sets. Ask students what types of numbers they know (e.g. whole numbers, fractions, decimals). Ask if they have heard of real numbers, and if so, what they know about them. Write the definition of real numbers on the board: " The sets of rational and irrational numbers together make up the set of real numbers". Explain that real numbers include rational numbers (numbers that can be written as p/q) and irrational numbers (numbers that cannot be written as p/q). Explain them that real number is any number that can be found in the real world. Explain that the set of real numbers, which is denoted by R, is the union of the set of rational numbers (Q) and the set of irrational numbers (Q'). So, we can write the set of real numbers as, $R = Q \cup Q'$. This indicates that real numbers include natural numbers, whole numbers, integers, rational numbers, and irrational numbers.
Next ask them what is meant by absolute value? Take their responses. Tell them that we have already learnt about absolute value of integers. Explain that the absolute value of a real number a is defined as the distance between zero (the origin) and that real number on the number line and as it is a distance, it is always positive. Write and tell about the symbol of absolute value "| |". Draw a number line on the board and express the absolute value of any number, say 5 and -5, on it. Elaborate how to find absolute value of a real umber, use and explain worked examples 1 and 2 given on page 9 of textbook. Encourage the students to ask questions if they need more explanation.

**Activity:**

Ask students to solve Q3(a, b, c) of Learning check 1.2 given on page 10 of textbook. Walk around the class and monitor their work. Guide them if necessary.

### Sum Up: (3 min)

Sum up the lecture by retelling about the set of real numbers and their absolute value.

### Assessment: (5 min)

To assess students ask them to solve "pause and Try" given at page 9 of textbook.

### Homework: (2 min)

Solve Q3(d to h) of Learning check 1.2 given on page 10 of textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 2 **Lesson Plan:** 1

**Unit Name:** Real Numbers **Topic:** Real Numbers on Number Line **Date**: _____

## Objective(s):

### At the end of this period, the students will be able to:

Represent real numbers on a number line.

### Resource Material:

Chalk/Marker, White/Blackboard, textbook page 9, 10/11

## Teaching & Learning Activities:

### Opening Activities/Warm-up: (5 min)

Say, "Assalaam u Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Begin the lesson by asking students about their homework. Start the lesson by asking students to define real numbers and give a few examples. Ask them if they remember representing rational numbers on a number line. Take their responses. Appreciate them.

**Main Activities/Concept Building: (25 mins)**

Ask students to open textbook page 8. Explain to students that all the positive real numbers are represented on the right side of the origin, and the negative ones are on the left side. The values of numbers increase when we move in the right direction on the number line and their values decrease when we move in the left direction on the number line. Draw number line on the board. Tell students that we can represent a real number on a number line by drawing a horizontal line with arrows on both ends. These arrows indicate that the number line keeps extending on both sides endlessly, as there are infinite positive and negative real numbers. For fractions, explain that if it is a proper fraction, the numerator value is less than the denominator value; hence, the given real number should be less than 1 and greater than zero. Similarly, if it is an improper fraction, the numerator value is greater than the denominator value; hence, the given real number should be greater than 1. Tell them that in such case, first convert the improper fraction into a mixed one. This conversion helps to locate the exact position of the given fraction on the number line. It helps to know between which integer the fraction lie. To draw digits on the number line we need to keep the same distance between all numbers. For decimals, tell them that we divide each segment of the number line into an appropriate number of smaller parts. Demonstrate it by solving examples given on page 9 and 10 on the textbook. Encourage the students to ask questions if they need more explanation.

**Activity:**

Ask students to solve Q2(a, b) of Learning check 1.2 given on page 10/11 of textbook. Walk around the class and monitor their work. Guide them if necessary.

**Sum Up: (3 min)**

Sum up the lecture by retelling about the set of real numbers and their absolute value.

**Assessment: (5 min)**

To assess students ask them to solve "pause and Try" given at page 10 of textbook.

**Homework: (2 min)**

Solve Q2(c to h) of Learning check 1.2 given on page 10/11 of textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 2 **Lesson Plan:** 2

**Unit Name:** Real Numbers **Topic:** Properties of Inequality **Date**: _____

## Objective(s):

### At the end of this period, the students will be able to:

Demonstrate properties of inequality of real numbers.

### Resource Material:

Chalk/Marker, White/Blackboard, textbook page 11, worksheet

## Teaching & Learning Activities:

### Opening Activities/Warm-up: (5 min)

Say, "Assalaam u Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Begin the lesson by asking students about their homework. Ask students if they can give any examples of inequalities they have encountered before (e.g., height comparisons, test scores). Take their responses. Appreciate them.

**Main Activities/Concept Building: (25 mins)**

Ask students to open textbook page 11. Explain that inequalities are used to compare values that are not equal. Tell them that today we will learn about inequality properties of real numbers. Introduce the four properties of inequality that will be covered in the lesson: the Trichotomy Property of Inequality, Transitive Property of Inequality, Addition Property of Inequality, and Multiplication Property of Inequality.

**Trichotomy Property of Inequality**

$\forall a, b \in \mathbb{R}$, one of the following can be true. Either $a = b$ or $a > b$ or $a < b$.

Explain that this property states that for any two real numbers a and b, exactly one of the following is true:
a < b, a = b, a > b. Provide a few examples to illustrate this property. Write two numbers say 5 and 7 on the board. There can be one of the following possibilities:

- 5 is less than 7 i.e.; 5 < 7
- 5 is equal to 7 i.e.; 5 = 7
- 5 is greater than 7 i.e.; 5 > 7

Ask them: Which statement is true?
Take responses and tell that "5 is less than 7" or 5<7 is true.
Again ask: Can more than one statement be true? Take responses and tell them that no other statement can be true, Hence the property is verified.
Similarly, explain the other 3 properties of inequality by giving examples to students.

Encourage the students to ask questions if they need more explanation.
.

**Sum Up: (3 min)**

Sum up the lecture by retelling about the properties of inequality of real numbers.

**Assessment: (5 min)**

To assess students ask them to state the properties of inequality of real numbers .

**Homework: (2 min)**

Complete the worksheet..

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

## Worksheet

**Name: _____** **Date: _____**

1. Verify trichotomy property of real numbers for the following numbers:
   a) -2 and 1.5

   b) 1/2 and -1/3

2. Name the correct property.

i. $\forall a, b, c \in R, a > b \Rightarrow a + c > b + c$

_____

ii. $a, b, c \in R$ and $c > 0, \quad a > b \Rightarrow ac > bc$

_____

iii. $\forall a, b, c \in R, a < b \wedge b < c \Rightarrow a < c$

_____

iv. $\forall a, b \in R,$ either $a = b$ or $a > b$ or $a < b$

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 2 **Lesson Plan:** 3

**Unit Name:** Real Numbers **Topic:** Properties of Addition **Date**:

## Objective(s):

### At the end of this period, the students will be able to:

Demonstrate properties of addition of real numbers.

### Resource Material:

Chalk/Marker, White/Blackboard, textbook page 11, 12, 14,

## Teaching & Learning Activities:

### Opening Activities/Warm-up: (5 min)

Say, "Assalaam u Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Begin the lesson by asking students about their homework. Write 2 or 3 numbers on the board and ask them to verify commutative/associative property of addition for these numbers. Take their responses and appreciate them.

**Main Activities/Concept Building: (25 mins)**

Ask students to open textbook page 11. Tell students today we will learn about closure property, commutative property and associative property of real numbers under addition. Write an addition problem on the board (e.g. **√**3+ **√** = ?) and ask the students to solve it.
Have a volunteer come to the board to show their work and explain how they solved the problem.
Tell them that the result of addition of two given real numbers is also a real number and this property is known as closure property of addition. Demonstrate the property by using example given on page 11.
Next introduce the commutative property of addition, which states that changing the order of numbers in addition does not change the sum. Write an example on the board (e.g. 4 + 1/2 = 1/2 + 4) and have the class solve it. Ask them if the answer is same on both sides. Demonstrate the property by using example given on page 11.
Similarly explain the associative property of addition. Tell them that this property states that $\forall\ a, b,\ c \in \mathbb{R}$, (a + b) + c = a + (b + c), i.e., if we are adding three real numbers, the sum is always the same regardless of the grouping of numbers. which states that the grouping of integers does not affect the sum. Write an example on the board (e.g. 4 + (7 + 2) = (4 + 7) + 2) and have the class solve it. Demonstrate the property by using example given on page 12.
Next ask them to tell about the additive identity and additive inverse. Take responses. Tell them that like in rational numbers, reals number also have 0 as additive identity and for every real number there is an opposite real number that sum up to 0. Use examples given on page 12 to demonstrate these properties. Encourage the students to ask questions if they need more explanation.

**Activity:**

Ask students to solve Q1, Q2(addition), Q3 of Learning check 1.3 given on page 14 of textbook. Walk around the class and monitor their work. Guide them if necessary.

**Sum Up: (3 min)**

Sum up the lecture by retelling about the properties of addition of real numbers.

**Assessment: (5 min)**

To assess students ask them to solve Q5 for addition parts (a, b) and Q6 for addition parts (a, b) of Learning check 1.3 given on page 14 of textbook.

**Homework: (2 min)**

Solve Q5 for addition parts (c to f) and Q6 for addition parts (c to f) of Learning check 1.3

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 2 **Lesson Plan:** 4

**Unit Name:** Real Numbers **Topic:** Properties of Multiplication **Date**:

## Objective(s):

### At the end of this period, the students will be able to:

Demonstrate properties of multiplication of real numbers..

### Resource Material:

Chalk/Marker, White/Blackboard, textbook page 12, 13, 14,

## Teaching & Learning Activities:

### Opening Activities/Warm-up: (5 min)

Say, “Assalaam u Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Begin the lesson by asking students about their homework. Write 2 or 3 numbers on the board and ask them to verify commutative/associative property of multiplication for these numbers. Take their responses and appreciate them.

**Main Activities/Concept Building: (25 mins)**

Ask students to open textbook page 11. Tell students today we will learn about closure property, commutative property and associative property of real numbers under multiplication. Write an addition problem on the board (e.g. **√**2 x **3** = ?) and ask the students to solve it. Have a volunteer come to the board to show their work and explain how they solved the problem. Tell them that the result of multiplication of two given real numbers is also a real number and this property is known as closure property of multiplication. Demonstrate the property by using example given on page 12.
Next introduce the commutative property of multiplication, which states that changing the order of numbers in multiplication does not change the product. Write an example on the board (e.g. 4 x 1/2 = 1/2 x 4) and have the class solve it. Ask them if the answer is same on both sides. Demonstrate the property by using example given on page 12.
Similarly explain the associative property of multiplication. Tell them that this property states that $\forall\ a, b, c \in \mathbb{R}$, (a x b) x c = a x (b x c), i.e., if we are multiplying three real numbers, the product is always the same regardless of the grouping of numbers. Write an example on the board (e.g. 4 x (7 x 2) = (4 x 7) x 2) and have the class solve it. Demonstrate the property by using example given on page 13.
Next ask them to tell about the multiplicative identity and multiplicative inverse. Take responses. Tell them that like in rational numbers, reals number also have 1 as multiplicative identity and for every real number there is a real number that when multiplied by the original number results in 1. Use examples given on page 13 to demonstrate these properties. In the same way explain the distributive propertied given on page 13 with examples. Encourage the students to ask questions if they need more explanation.

**Activity:**

Ask students to solve Q1, Q2(multiplication), Q4 of Learning check 1.3 given on page 14 of textbook. Walk around the class and monitor their work. Guide them if necessary.

**Sum Up: (3 min)**

Sum up the lecture by retelling about the properties of multiplication of real numbers.

**Assessment: (5 min)**

To assess students ask them to solve Q5 for multiplication parts (a, b) and Q6 for multiplication parts (a, b) of Learning check 1.3 given on page 14 of textbook.

**Homework: (2 min)**

Solve Q5 for multiplication parts (c to f) and Q6 for multiplication parts (c to f) and Q 7of Learning check 1.3

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 2 **Lesson Plan:** 5

**Unit Name:** Real Numbers **Topic:** Rounding Off **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify rules to round off numbers to specific significant figures.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 14, 15

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 mins)**

Say, "Assalaam u Alaikum" and start with the name of Allah.

Ask students: How are you? Encourage them to say, "Alhamdulillah".

Begin the lesson by asking students about their homework Write down few 5 or 6 digit value on the board and ask students randomly to round off the values to the nearest 10, 100 , 1000. Appreciate students for correct attempt.

**Main Activities/Concept Building: (25 mins)**

**Activity 1:**

Explain to students that we can round off numbers to get an idea or an estimate. Explain that most common and easiest estimation is rounding off that helps us quickly estimate the number we need to use in various calculations. Tell them that it helps us make a complicated number much simpler to work with. Describe to the students that today we will learn rules to round off numbers to specific significant figures. Ask them: Do you remember what is meant by significant figures? Take their responses. Then tell them that significant figures are the number of figures or digits that indicate the accuracy of any calculation or measurement.

- All non-zero digits are significant figures. For example, 172.3 has 4 significant figures.
- Zeros at the start of a number are never significant. For example, 0.0789 has only 3 significant figures.
- Zeros that are within any two non-zero digits are significant. For example, 89.045 has 5 significant figures.
- Zeros at the end of a number after the decimal point are significant. For example, 9.500 has 4 significant figures.
- Zeros at the end of whole numbers are not significant. For example, 9500 has 2 significant
- figures.

Explain the given example to tell how rounding off to different significant figures result in different answers. Then explain the rules to round to the specified number of significant figures one by one which are given on page.

When rounding to the specified number of significant digits, round down if the next digit is less than 5 and round up when the next digit is greater than or equal to 5. Ask students to open textbook page 15. Demonstrate the method to round off numbers and decimals to specified number of significant figures by explaining the worked examples 1 and 2 given on page 15. Encourage the students to ask questions if they need more explanation.

**Sum Up: (3min)**

Sum up the lesson by retelling the definition of rounding off, significant figures and rules to round off.

**Assessment: (5 min)**

Assess students' understanding by asking them to tell about significant figures and the rules to round off.

**Homework: (2 min)**

Solve "Pause and Try" given on page 15 and 16 of textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 2 **Lesson Plan:** 6

**Unit Name:** Real Numbers **Topic:** Rounding Off **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Round off numbers up to 5 significant figures.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 16, 17, basket, paper slips

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaam u Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Begin the lesson by asking students about their homework. Ask students to tell about significant figures and the rules to round off. Write a random number on board and ask students to round it off to nearest 10, 100 or 1000. Appreciate students for correct answers.

**Main Activities/Concept Building:** **(25 mins)**

**Activity 1:**

Start by reviewing the rules of rounding off numbers to specified number of digits. After that, divide the class into pairs. Place number cards [Consisting of Q1(a, b, c, d, e, f) and Q2(a, b, c, d, e, f) of Learning check 1.3 page 16]. Instruct the pairs to shuffle the cards and place them face down on the table. Ask one member from each pair to pick a card from the deck and read it out loud. Instruct the pairs to race against each other to round off the number on the card to the specified number of digits. Once they have rounded off the number, ask them to shout out the rounded off number. The first pair to shout out the correct answer wins a point. Keep playing until all the cards have been used, or until a specific number of points have been reached.

**Activity 1:**

Divide student in groups. Put paper slips [Consisting of Q3(a, b, c, d, e, f) of Learning check 1.3 page 16] in a basket. Call students randomly from each group and ask them to pick one slip randomly. Then round the number to 5 significant figures. Repeat till all groups have their turns.

**Sum Up:** **(3min)**

Sum up the lesson by retelling the definition of rounding off, significant figures and rules to round off.

**Assessment:** **(5 min)**

Assess students' understanding by asking them to tell about significant figures and the rules to round off.

**Homework:** **(2 min)**

Solve Q1(g to l) and Q2(g to l), Q3(g to l), Q4 and 5 Learning check 1.3 page 16/17.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 2 **Lesson Plan:** 7

**Unit Name:** Real Numbers **Topic:** Rounding Off **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Analyze approximation error when numbers are rounded off (including real-world word problems).

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 16, 17

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaam u Alaikum" and start with the name of Allah.

Ask students: How are you? Encourage them to say, "Alhamdulillah".

Begin the lesson by asking students about their homework. Write a 7-digit number on the board. Ask students to verbally tell how to round it off to 5 significant figures. Follow their steps and solve it on board. If they correctly tell the steps, appreciate them.

**Main Activities/Concept Building:** **(25 mins)**

**Activity 1:**

Start by reviewing the rules of rounding off numbers to specified number of digits. After that tell them that we will learn about approximation error when we round off numbers. Have them open textbook page 16. Explain the definition of approximation error as the difference between an exact value and the approximated value of something. Provide example of measuring the mass of a sugar bag. Explain that the mass of a bag of sugar is exactly 40.53 kg, but the weighing scale allows you to weigh only up to one decimal place, or nearest 0.1. So, the approximate mass will be mentioned as 40.5 kg. Similarly, provide another example that if the exact length of an electric wire is 25.82 metres, but when measured with a measuring tape, which only allows measuring to the nearest tenth, the approximate length will be mentioned as 25.8 metres. Tell them that this difference between the approximated value and actual value is the approximation error. Elaborate the concept further by explaining worked example given on page 16. Explain that the measured volume of liquid is 10 litres which is correct to nearest litre. Ask them: What number could be rounded to 10? Take their opinions. Then tell them that to get the rounded answer to 10(rounded to nearest litre), the actual volume could be 0.5 less or more than it. So, we must add and subtract 0.5 from 10 to get the range of actual volume.

10 + 0.5 = 10.5 litres

or 10 – 0.5 = 9.5 litres

So, the actual volume could be anywhere between 9.5 litres and 10.5 litres. Encourage the students to ask questions if they need more explanation.

**Sum Up:** **(3min)**

Sum up the lesson by retelling the definition of approximation error and how to find it.

**Assessment:** **(5 min)**

Assess students' understanding by asking them to solve the given problem:

Uzma measured the length of a chain and found it to be 32 cm (correct to the nearest cm). What could be the actual possible length of the chain?

**Homework:** **(2 min)**

Solve Q6 of Learning check 1.3 on page 16/17 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 3 **Lesson Plan: 1**

**Unit Name:** Real Numbers **Topic:** Unit check **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 1 by solving Q1-4 of Unit Check Exercise..

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 17-18.

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Tell students that they are going to revise all the concepts of the Unit Real numbers.
Ask them the different questions that are related to the unit.

**Main Activities/Concept Building: (30 min)**

**Activity:**

Have students open page 17-18 of their textbooks. Ask them to solve Q1, Q2 and Q3 of “Unit check 1” of their textbooks. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Sum Up: (3 min)**

Sum up the lesson by repeating the important points given in Sum-Up of the unit given at page 17.

**Assessment: (0 min)**

N/A

**Homework: (2 min)**

Solve Q4 of Unit check 1 given at page 18 of their textbooks.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 3 **Lesson Plan: 2**

**Unit Name:** Real Numbers **Topic:** Unit check **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 1 by solving Q5-8 of Unit Check Exercise..

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 18-19.

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Tell students that they are going to revise all the concepts of the Unit Real numbers.
Ask them the different questions that are related to the unit.

**Main Activities/Concept Building: (30 min)**

**Activity:**

Have students open page 17-18 of their textbooks. Ask them to solve Q5, Q6 and Q7 of “Unit check 1” of their textbooks. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Sum Up: (3 min)**

Sum up the lesson by repeating the important points of the unit.

**Assessment: (0 min)**

N/A

**Homework: (2 min)**

Solve Q8 of Unit check 1 given at page 19 of their textbooks.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 3 **Lesson Plan: 3**

**Unit Name:** Real Numbers **Topic:** Unit check **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 1 by solving Q9-10 of Unit Check Exercise and by completing "work with math" activity.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 19.

**Teaching & Learning Activities:**

## Opening Activities/Warm-up: (5 min)

Say, "Assalaamu Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Tell students that they are going to revise all the concepts of the Unit Real numbers.
Ask them the different questions that are related to the unit.

## Main Activities/Concept Building: (30 min)

**Activity 1:**

Have students open page 17-18 of their textbooks. Ask them to solve Q9 of "Unit check 1" of their textbooks. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Activity 2:**

Tell students that now we are going to do an activity of 'work with math' on page 19.
Work in groups.
The teacher will put paper slips with various sums having non-terminating decimal results in a basket.
Each pair picks 5 random paper slips from the basket.
Then they calculate the answers using both types of calculators.
Finally, record the results from each calculator for the same question and analyze the rounding and approximation errors.

## Sum Up: (3 min)

Sum up the lesson by repeating the important points of the unit.

## Assessment: (0 min)

N/A

## Homework: (2 min)

Solve Q10 of Unit check 1 given at page 19 of their textbooks.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 3 **Lesson Plan:** 4

**Unit Name:** Square roots and Cube Roots **Topic:** Exponents and Laws of Exponents **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify base, index/exponent and its value.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 20, 21, 22, 26

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(8 mins)**

Say, "Assalaamu Alaikum" and start with the name of Allah.

Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work.

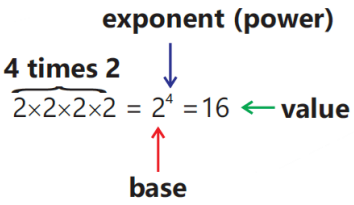
Have students open textbook at page 20. Quickly recall the concepts related to questions given in rapid recall. Then ask them to solve those question. Read the opening page question and tell them that we will be able to solve it after learning about the concepts of the unit.

(***Note for teachers:*** *The sections "Think out of the box", "Talk over and write" and "Technology corner" are supplementary exercises. These can also be given to students who finish their work quickly or are fast learners.)*

## Main Activities/Concept Building: (25 min)

Before the main concept, tell them briefly about the unit outline and its real-life relevance. Have students open textbook at page 21. Introduce the concept by telling students that sometimes when writing large numbers in form of repeated multiplication, it becomes so lengthy and time taking task. To make such long repeated multiplication, we use exponential notation. Write $2 \times 2 \times 2 \times 2$ on the board. Ask students to solve and tell the answer. Again, write $2 \times 2 \times 2 \times 2$ on the board. Ask students to solve and tell the answer. Ask them how many 2s are there? Take response and tell them that as there are four 2s, so we can write it in exponential form as: $2 \times 2 \times 2 \times 2 = 2^4 = 16$

Label 2 as base, 4 as index(exponent) and 16 as value. Elaborate when writing numbers in exponential notation, the number that is being multiplied together is called the base. The number of times its being multiplies together is the index, power or exponent. The answer of the repeated multiplication is called the value. Similarly explain the other examples given on page 21 and 22 and elaborate the concept. Encourage the students to ask questions if they need more explanation.




**Activity:**

Ask students to solve Q1(a, b, c) and Q2(a, b, c) of Learning check 2.1 given on page 26 of textbook. Walk around the class and monitor their work. Guide them if necessary.

**Sum Up:** **(2 min)**

Sum up the lesson by retelling about the exponential form, base, exponent and value of exponential form.

**Assessment:** **(3 min)**

Assess students' understanding by asking them to solve "Pause and Try" given on page 21 of textbook.

**Homework:** **(2 min)**

Solve Q1(d to h) and Q2(d to f) of Learning check 2.1 given on page 26 of textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 3 **Lesson Plan:** 5

**Unit Name:** Square roots and Cube Roots **Topic:** Product Law **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Deduce and apply product law of Exponents/Indices.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 22, 26

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaamu Alaikum" and start with the name of Allah.

Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work.

Ask the students about their homework. Write a few repeated multiplication sentences on the board. Ask students to quicky write them in exponential form in their notebooks. Appreciate them for their correct answers.

**Main Activities/Concept Building:** **(25 min)**

Have students open textbook at page 22. Begin the lesson by telling students that exponent rules are those laws that are used for simplifying expressions with exponents. Tell them that many calculations involving powers can be conveniently performed in quick steps using the laws of exponents. Explain that these rules also help in simplifying numbers with complex powers. Tell them that today we will learn about "product law" of exponents. Explain the two cases of this law. Write statement of case I on the board.

Case I: When bases are the same but exponents are different.

Using examples 1 and 2 given on page 22, deduce that "when multiplying two or more rational numbers with the base the same but different exponents, we can add the exponents while keeping the base same.

Write the general form of the law:

If a is any real number and m, n $\in$ R, then $a^n \times a^m = a^{m+n}$. Write a few more examples to elaborate the concept further.

In the same way, write the statement of Case II and deduce the law by explaining Example 3 and 4 given on page 23. Then write the general form of the law and further elaborate it using more examples.

Encourage the students to ask questions if they need more explanation.

**Activity:**

Ask students to solve Q3(a, b, c, d) of Learning check 2.1 given on page 26 of textbook. Walk around the class and monitor their work. Guide them if necessary.

**Sum Up:** **(2 min)**

Sum up the lesson by retelling about the product law and its relevant cases.

**Assessment:** **(6 min)**

Assess students' understanding by asking them to solve "Pause and Try" given on page 23 of textbook.

**Homework:** **(2 min)**

Solve Q3(e to l) of Learning check 2.1 given on page 26 of textbook

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 3 **Lesson Plan:** 6

**Unit Name:** Square roots and Cube Roots **Topic:** Quotient Law **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Deduce and apply quotient law of Exponents/Indices..

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 23 to 27

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, “Assalaam u Alaikum” and start with the name of Allah.

Ask the students: How are you? Encourage them to say, “Alhamdulillah”. Start with ‘Bismillah’ and tell them to recite it before starting any work.

Ask the students about their homework. Write a few repeated multiplication sentences on the board with same or different bases. Ask students to apply product law and simplify them. Appreciate them for their correct answers.

**Main Activities/Concept Building:** **(25 min)**

Have students open textbook at page 22.. Tell them that today we will learn about “quotient law” of exponents. Explain the two cases of this law. Tell them that this law is also called the law of division because it deals with the division of exponents and addresses two cases. Write the statement of case I on the board. Deduce the law using the examples given on page 23 and 24. Then write the general form of the law and if required, provide more examples to students using the questions in “Pause and Try”. Encourage the students to ask questions if they need more explanation. Explain negative exponent law and zero exponent law (which are part of quotient law) using examples on page 24. In the same way, write the statement of Case II and deduce the law by explaining Example 1 and 2 given on page 25. Then write the general form of the law and if required, provide more examples to students using the questions in “Pause and Try”. Encourage the students to ask questions if they need more explanation.

**Activity:**

Ask students to solve Q4(a, b, c) of Learning check 2.1 given on page 26/27 of textbook. Walk around the class and monitor their work. Guide them if necessary.

**Sum Up:** **(2 min)**

Sum up the lesson by retelling about the quotient law and its further cases.

**Assessment:** **(6 min)**

Assess students’ understanding by asking them to solve Q4(d) of Learning check 2.1 given on page 26/27 of textbook.

**Homework:** **(2 min)**

Solve Q4(e to k) of Learning check 2.1 given on page 26/27 of textbook

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 3 **Lesson Plan:** 7

**Unit Name:** Square roots and Cube Roots **Topic:** Power Law **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Deduce and apply power law of Exponents/Indices.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 25 to 27

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaam u Alaikum" and start with the name of Allah.

Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work.

Ask the students about their homework. Write the following expressions on the board and ask students to simplify them using laws of exponents.

a) $2^3 \times 2^5$ b) $3^5 \div 3^3$ c) $9^4 \times 9^2$

Appreciate them for their correct answers.

**Main Activities/Concept Building:** **(25 min)**

Have students open textbook at page 25. Tell them that today we will learn about "Power law" of exponents.

Tell them that the power law in exponents is a rule that is applied to simplify an expression when a base is raised to a power, and then the whole expression is raised to another power. Tell them that this is the reason this law is called power law or sometime power of the power law. Using the worked example 1 and 2 given on page 25-26, deduce the power law. After this, write the statement of the law on the board and also its generalized form.

"If a number has two or more exponents (powers), we multiply the powers together while keeping the same base." Write the general form and explain it.

General form:

If a is any real number and m, n $\in$ R, then $(a^m)n = a^{m \times n} = a^{mn}$.

Encourage the students to ask questions, if there is a need, provide more explanation of the concept using more examples.

**Activity:**

Ask students to solve Q5(a, b) of Learning check 2.1 given on page 26/27 of textbook. Walk around the class and monitor their work. Guide them if necessary.

**Sum Up:** **(2 min)**

Sum up the lesson by retelling about the power law with a few examples.

**Assessment:** **(6 min)**

Assess students' understanding by asking them to solve Q5(c) of Learning check 2.1 given on page 26/27 of textbook.

**Homework:** **(2 min)**

Solve Q5(d-e-f) of Learning check 2.1 given on page 26/27 of textbook

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 4 **Lesson Plan:** 1

**Unit Name:** Square roots and Cube Roots **Topic:** Square Roots **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Find the square root of natural numbers (up to 4 digits).

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 27 to 31.

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaam u Alaikum" and start with the name of Allah.

Ask students: How are you? Encourage them to say, "Alhamdulillah".

Begin the lesson by reviewing the concept of square roots with the students. Ask them about square roots and their calculation. Take responses and then tell them that the square root of a number is a factor of the number that, when multiplied by itself, gives the number. Have them open page 27 and draw the figure of square on the board. Explain the relationship between area and square root of a square. Also recall the definition of perfect square as A number is called a perfect square if it is a square of any number. A perfect square has a pair of the same factors.

**Main Activities/Concept Building:** **(25 mins)**

Tell students that there are two ways of finding square roots.

Factorization method Division method

Tell them that we will use both methods in this unit as we are already familiar with both methods. Have them open page 28. Tell them that today we are going to learn about finding square roots of natural numbers of up to 4-digits. Read the statement of worked example 1 given on page 28. Tell them that in this question we will find square root of natural numbers using prime factorization method. Step by step explain the method to students. Next move to page 29 Worked example 3. Ask the students "What information is given in the question?". Take responses. Then tell them that the number of tiles required for tiling a masjid's floor is given. Again ask " what do we need to find in the question?" Take responses. Then tell them that we need to find the number of tiles in each row. Ask: Can anyone tell how we can find the number of tiles? Take responses. Then tell them that as the length and width of floor is same, so there will be equal number of tiles in rows and column. Tell them that we can find it by finding square root of total number of tiles i.e. 9409. Step by step explain the method to students. Encourage the students to ask questions if they need more explanation. Tell them that if it's not mentioned in the question, we can use any method to calculate square roots. Ask them to open textbook page 30. Solve Q5 of learning check 2.2 given on page 30 of textbook on the board with maximum input of students for each step. Appreciate for their participation and encourage the students to ask questions if they need more explanation.

**Activity:**

Have students work in pairs. Ask them to solve Q1(a) of learning check 2.2 given on page 30 of textbook. Walk around the class, monitor their working and guide them where required.

**Sum Up:** **(3min)**

Sum up the lecture by retelling the steps of finding square roots by division method and factorization method.

**Assessment:** **(5min)**

To assess students' learning, ask them solve Q1 (b, c) of learning check 2.2 given on page 30 of textbook. Walk around the class, monitor their working and guide them where required.

**Homework:** **(2 min)**

Solve Q2 (a-d) and Q11 of learning check 2.2 given on page 30/31 of textbook

**Teacher's Self-Evaluation:** **Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 4 **Lesson Plan:** 2

**Unit Name:** Square roots and Cube Roots **Topic:** Square Roots **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Find the square root of natural numbers (up to 6 digits).

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 27, 28, 30, 31

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaam u Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Ask the students about their homework. Write a random word problem on the board involving square roots. Ask students to find the square root. Appreciate them for their correct answers.

**Main Activities/Concept Building:** **(25 mins)**

Have them open page 27. Tell them that today we are going to learn about finding square roots of natural numbers of up to 6-digits.
Read the statement of worked example 1. Ask the students "What information is given in the question?". Take responses. Then tell them that the square-shaped piece of land is given which is 236196 square metres. Again ask " what do we need to find in the question?" Take responses. Then tell them that we need to find the length of the side of the land. Ask: Can anyone tell how we can find the side length? Take responses and then tell them that to find the length we need to find the square root of the total area. Tell them that in this question we will find square root of natural numbers using division method. Step by step explain the method to students. Tell them that if it's not mentioned in the question, we can use any method to calculate square roots.
Ask them to open textbook page 30. Solve Q6 and 7 of learning check 2.2 on the board with maximum input of students for each step. Appreciate for their participation and encourage the students to ask questions if they need more explanation.

**Activity:**

Ask students to solve Q1(d, e) of learning check 2.2 given on page 30 of textbook. Walk around the class, monitor their working and guide them where required.

**Sum Up:** **(3min)**

Sum up the lecture by retelling the steps of finding square roots by division method and factorization method.

**Assessment:** **(5min)**

To assess students' learning, ask them solve Q2 (e) of learning check 2.2 given on page 30 of textbook. Walk around the class, monitor their working and guide them where required.

**Homework:** **(2 min)**

Solve Q2 (f-g) and Q8,9, and 10 of learning check 2.2 given on page 30

**Teacher's Self-Evaluation:** **Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 4 **Lesson Plan:** 3

**Unit Name:** Square roots and Cube Roots **Topic:** Square Roots **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Find the square root of common fractions (up to 6 digits).

**Objective(s):**

**At the end of this period, the students will be able to:**

Find the square roots of fractions using factorization method.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 28, 29, 30

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaam u Alaikum" and start with the name of Allah.

Ask students: How are you? Encourage them to say, "Alhamdulillah".

Recall steps of finding square roots of natural numbers. Next ask them to tell what a fraction is? Take responses and ask about the numerator and denominator of a fraction. Take their answers and appreciate their replies.

**Main Activities/Concept Building:** **(25 mins)**

Ask students to open textbook page 28. Tell them that today we are going to learn about finding square root of fractions using division method. Tell them that finding square root of fraction using division method, we follow the same steps as for natural numbers. The difference will be only that for fractions we find the square root of numerator and denominator separately and then write the square root of numerator and denominator in fraction form. In simple way we can write it as :

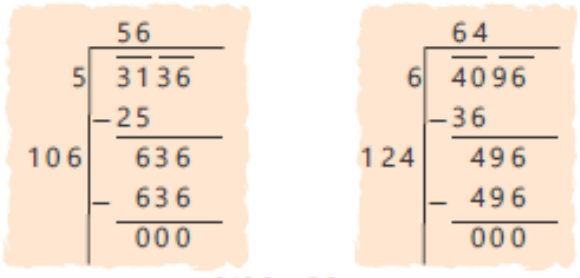
$$\sqrt{Fraction} = \frac{\sqrt{Numerator}}{\sqrt{Denominator}}$$

Tell them that to find the square root of the given fraction by the division method, we find the square roots of the numerator and denominator separately and then write their square roots as numerator and denominator respectively. Demonstrate the method by explaining the worked example 2 given on page 28-29 of textbook.

$\frac{\sqrt{3136}}{\sqrt{4096}}$

3136 = $\overline{31}\,\overline{36}$

4096 = $\overline{40}\,\overline{96}$




So, $\frac{\sqrt{3136}}{\sqrt{4096}}$ = 56/64.

Next to elaborate factorization method of finding square roots of decimals, solve questions in "pause and Try " given on page 29/30 of textbook. Encourage the students to ask questions if they need more explanation

**Activity:**

Have students work in pairs. Ask them to solve Q1(f-g) of learning check 2.2 given on page 30 of textbook. Walk around the class, monitor their working and guide them where required.

**Sum Up:** **(3min)**

Sum up the lecture by retelling the steps of finding square roots of fractions.

**Assessment:** **(5min)**

To assess students' learning, ask them solve Q1(h) of learning check 2.2 given on page 30 of textbook.

**Homework:** **(2 min)**

Solve Q1(i-k) and Q3(a to g) of learning check 2.2 given on page 30 of textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 4 **Lesson Plan:** 4

**Unit Name:** Square roots and Cube Roots **Topic:** Square Roots **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Find the square root of decimal numbers (up to 6 digits).

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 29, 30 .

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaam u Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Recall steps of finding square roots of natural numbers. Next ask them to tell what a decimal is? Take responses. Then write 12.128 on the board and ask students if they can convert it into a fraction. Take their answers and appreciate them.

**Main Activities/Concept Building:** **(25 mins)**

Ask students to open textbook page 29. Tell them that today we are going to learn about finding square root of decimal using division method. Tell them that finding square root of decimal using division method, we follow the same steps as for natural numbers. The difference will be only that for decimals, first we convert them into fractions and then find the square root of numerator and denominator separately. After this write the square root of numerator and denominator in fraction form.

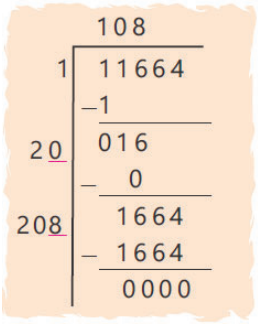
Demonstrate the method by explaining the worked example 4 given on page 29 of textbook.
Tell them to tell how to convert 116.64 into fractions? ? Take responses. Then proceed step by step and explain each step.
116.64= 11664/100. Now find square root of numerator 11664 and denominator 100 separately.

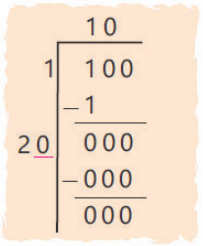
$$\frac{\sqrt{11664}}{\sqrt{100}}$$

$\sqrt{11664}$ = 108 and $\sqrt{100}$ = 10

$\sqrt{11664/100} =$ 108/10

Tell them to express 108/10 in decimal form as the question is in decimal.
So, 108/10 = 10.8
Encourage the students to ask questions if they need more explanation.




**Activity:**

Have students work in pairs. Ask them to solve Q1(l and m) of learning check 2.2 given on page 30 of textbook. Walk around the class, monitor their working and guide them where required.

**Sum Up:** **(3min)**

Sum up the lecture by retelling the steps of finding square roots of decimals.

**Assessment:** **(5min)**

To assess students' learning, ask them solve Q1(n) of learning check 2.2 given on page 30 of textbook

**Homework:** **(2 min)**

Solve Q1(m) and Q4(a to g) of learning check 2.2 given on page 30 of textbook

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 4 **Lesson Plan:** 5

**Unit Name:** Square roots and Cube Roots **Topic:** Cube and Cube Roots **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Recognise perfect cubes and find cubes of up to 2-digit numbers.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 31, 32 & 34, index cards/paper slips

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaamu Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Ask students about their previous day homework. Write 12 x 12 on the board and ask students to tell the answer. Take their responses. Probably they will say "square of 12". Again write 12 x 12 x 12. Ask them what is this showing? Take responses and appreciate if they correctly respond.

**Main Activities/Concept Building:** **(25 mins)**

Ask the students open page 31. Introduce the concept of cube of numbers. Tell them that when a number is raised to the power of 3, the answer is known as the cube of that number. Tell that when we multiply a number 3 times together, we can write that number to the power of 3. For example, $a \times a \times a = a^3$, we read it as a raised to the power of 3 or a to the power 3 or the cube of a.
Explain that the **cube** of a number is the result of multiplying that number three times together.
If a number is a cube of any number, it is called a perfect cube(or cube number). Tell them that 1, 8, 27, 64, ⋯ etc. are perfect cubes of 1, 2, 3, 4, ⋯ etc., and so on. Give a few example and explain the concept e.g. For example, 8 is a perfect cube because it's 2 x 2 x 2 (2 multiplied by itself twice); this is also written as $2^3$ ("two cubed"). Another example of a perfect cube is 27 because it's $3^3$ (3 x 3 x 3, or "three cubed"). Tell them that to find the cube of any number, first, multiply that number by itself, then multiply the product obtained with the original number again. Give example of finding cube of 7 through the same process. Explain the examples given on page 31 of textbook and tell them that the cube of a positive number is positive and the cube of a negative number is negative. Next have them open textbook page 32. Show them the table of cubes of number. Ask them to observe the cubes of first 20 natural numbers. Also tell them that to check if a given number is a perfect cube or not, we find its prime factorization. If it is expressible as the product of cubes of the prime factors, the number is a perfect cube. Elaborate the concept by solving Q5 of Learning check 2.3 at page 34/35 of textbook.

**Activity 1:**

Divide the class into pairs. Give each pair a set of numbers (up to 2 -digits) written on index cards or paper slips. Each pair takes turns drawing a card from the stack and calculating the cube of the number on the card. If the pair correctly calculates the cube, they earn a point. If they are incorrect, the next pair has a chance to steal the point by correctly calculating the cube. The game continues until all the cards have been used. The pair with the most points at the end of the game wins.

**Sum Up:** **(3min)**

Sum up the lecture by recalling definitions of cubes and perfect cubes(or cube numbers). Also re-tell the method to find the cube of any number.

**Assessment:** **(5min)**

Ask students to solve Q1 (a, b, c) of 'Learning check 2.3' at page 34 of textbook.

**Homework:** **(2 min)**

Solve Q1 (d to l) and Q6 of 'Learning check 2.3' at page 34/35 of textbook

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 4 **Lesson Plan:** 6

**Unit Name:** Square roots and Cube Roots **Topic:** Cube and Cube Roots **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Understand the concept of cube roots of up to 5-digit numbers.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 32

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

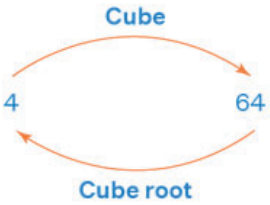
Say, "Assalaamu Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Ask students about their previous day homework. Write a few 2- or 3-digit numbers on the board. Ask students to find their cube. Take responses and appreciate their effort.

**Main Activities/Concept Building:** **(25 mins)**

Tell them that we know that the **cube** of a number is the result of multiplying that number twice by itself. Now we will learn about the concept of cube roots. Tell them that finding a cube root is opposite of cubing a number. For example, the cube of 4 is 64 and the cube root of 64 is 4.

$4^3 = 4 \times 4 \times 4 = 64$

$\sqrt[3]{64} = 4$




Explain the relation of cubes and cube roots by using figure.
Have students open textbook page 32. Explain the introductory examples of cube roots. Introduce the symbol $\sqrt[3]{\ }$ of cube root to them and tell them that $\sqrt{\ }$ is called the radical sign and 3 is the index of the radical. The number written inside the radical sign is known as radicand. Write a few examples on board and point out the radicand, index of the radicand and radical sign in them. Tell them that we can say that if a and b are any positive numbers, then $a^3 = b$ implies that $\sqrt[3]{b} = a$ and It is read as "cube root of b is a".
Tell them that in symbolic form, we write that:
If $1^3 = 1$, then $\sqrt[3]{1} = 1$. Explain that this means "if cube of 1 is 1, then cube root of 1 is 1".
If $2^3 = 8$, then $\sqrt[3]{8} = 2$. Explain that this means "if cube of 2 is 8, then cube root of 8 is 2".
Similarly, for larger numbers, we can write that:
If $20^3 = 8000$, then $\sqrt[3]{8000} = 20$. Explain that this means "if cube of 20 is 8000, then cube root of 8000 is 20"
Encourage the students to ask questions if they need more explanation.

**Sum Up:** **(3min)**

Sum up the lecture by recalling the definition of cube roots and the relation between cube and cube roots.

**Assessment:** **(7 min)**

To check students' learning, write 4 x 4 x 4 = 16, 15 x 15 x 15 = 3375 or similar sentences on board and ask them to write it in the form of cube root using symbol.

**Homework:** **(2 min)**

Revise classwork.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 4 **Lesson Plan:** 7

**Unit Name:** Square roots and Cube Roots **Topic:** Cube and Cube Roots **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Find the cube roots of natural numbers up to 5-digits.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 32, 33, 34, 35

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaamu Alaikum" and start with the name of Allah.

Ask students: How are you? Encourage them to say, "Alhamdulillah".

Begin the lesson by reviewing the concept of cube roots with the students. Ask them what they already know about finding cube roots. Explain to them that today they will be learning how to find the cube roots of perfect cubes of natural numbers.

**Main Activities/Concept Building:** **(25 mins)**

Have students open page 33. Tell them that today we are going to learn about the method of finding cube roots of natural numbers. Explain to students that to find the cube root of the numbers, we follow these steps.

**Step I:** Factorize the number into its prime factors.

**Step II:** Group the three identical prime factors (if possible).

**Step III**: Take one element from each group and find the product.

The product thus obtained is equal to the cube root of the number.

Ask them to open textbook page 32. Read the statement of worked example 1. Ask the students "What information is given in the question?". Take responses. Then tell them that the volume of a cube-shaped container is given which is 17576 cubic metres.. Again ask " what do we need to find in the question?" Take responses. Then tell them that we need to find the length of the side of the container. Ask: Can anyone tell how we can find the side length? Take responses. Tell them that to find the length we need to find the cube root of the total area i.e. 17576 $m^3$. After they understand the concept, explain them the method to find cube root. Step by step explain the solution. Similarly Ask them to open textbook page 33 worked example 2 and elaborate it step by step. Encourage the students to ask questions if they need more explanation.

**Activity:**

Have students work in pairs. Ask them to solve Q2(a-b-c) of learning check 2.3 given on page 34/35 of textbook. Walk around the class, monitor their working and guide them where required.

**Sum Up:** **(3 min)**

Sum up the lecture by retelling the steps of finding cube roots by factorization method by explain Worked example 3 (a) given at page 33.

**Assessment:** **(5min)**

To assess students' learning, ask them solve Q4 of learning check 2.3 given on page 35 of textbook. Walk around the class, monitor their working and guide them where required.

**Homework:** **(2 min)**

Solve Q2 (d to l and o) of learning check 2.3 given on page 35 of textbook

**Teacher's Self-Evaluation:** **Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 5 **Lesson Plan:**1

**Unit Name:** Square roots and Cube Roots **Topic:** Cube and Cube Roots **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Find the cube roots of fractions.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 33, 34, 35, 36 .

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaam u Alaikum" and start with the name of Allah.

Ask students: How are you? Encourage them to say, "Alhamdulillah".

Recall steps of finding cube roots of natural numbers. Next ask them to tell how can we find the cube root of a fraction? Take their answers and appreciate their replies.

**Main Activities/Concept Building:** **(25 mins)**

Ask students to open textbook page 33. Tell them that today we are going to learn about finding cube root of fractions. Tell them that finding cube root of fraction, we follow the same steps as for natural numbers. The difference will be only that for fractions we find the cube root of numerator and denominator. In simple way we can write it as :

$\sqrt[3]{Fraction} = \frac{\sqrt[3]{Numerator}}{\sqrt[3]{Denominator}}$

Tell them that to find the cube root of the given fraction by the division method, we find the cube roots of the numerator and denominator separately and then write their cube roots as numerator and denominator respectively. Demonstrate the method by explaining the worked example 3(part b) given on page 33/34 of textbook.

$\frac{\sqrt[3]{125}}{\sqrt[3]{343}}$

125 = 5 x 5 x5

343 = 7 x 7 x 7

Next tell them that we will take factor out of 3 identical factors.

| 5 | 125 |
|---|---|
| 5 | 25 |
| 5 | 5 |
| | 1 |

| 7 | 343 |
|---|---|
| 7 | 49 |
| 7 | 7 |
| | 1 |

$\sqrt[3]{125} = 5$ and $\sqrt[3]{343} = 7$

So, $\frac{\sqrt[3]{125}}{\sqrt[3]{343}} = 5/7$

Encourage the students to ask questions if they need more explanation

**Sum Up:** **(3min)**

Sum up the lecture by retelling the steps of finding cube roots of fractions.

**Assessment:** **(5min)**

To assess students' learning, ask them solve Q2(m) of learning check 2.3 given on page 35 of textbook.

**Homework:** **(2 min)**

Solve Q2(n) of learning check 2.3 given on page 35 of textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 5 **Lesson Plan:**2

**Unit Name:** Square roots and Cube Roots **Topic:** Cube and Cube Roots **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Find the cube roots of decimals.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 33, 34 and 35

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaam u Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Recall steps of finding cube roots of natural numbers and fractions. Next ask them how can we calculate the cube root of decimal numbers? Take their answers and appreciate them.

**Main Activities/Concept Building:** **(25 mins)**

Ask students to open textbook page 33. Tell them that today we are going to learn about finding cube root of decimals. Tell them that finding cube root of decimal, we follow the same steps as for natural numbers. The difference will be only that for decimals, first we convert them into fractions and then find the cube root of numerator and denominator separately. After this write the cube root of numerator and denominator in fraction form. Demonstrate the method by explaining the worked example 3(part c) given on page 33-34 of textbook.
Tell them to tell how to convert 5.832 into fractions? Take responses. Then proceed step by step and explain each step.
5.832 = 5832/1000. Now find cube root of numerator 5832 and denominator 1000 separately.

$\frac{\sqrt[3]{5832}}{\sqrt[3]{1000}}$

| | |
|---|---|
| 2 | 5832 |
| 2 | 2916 |
| 2 | 1458 |
| 3 | 729 |
| 3 | 243 |
| 3 | 81 |
| 3 | 27 |
| 3 | 9 |
| 3 | 3 |
| | 1 |

| | |
|---|---|
| 2 | 1000 |
| 2 | 500 |
| 2 | 250 |
| 5 | 125 |
| 5 | 25 |
| 5 | 5 |
| | 1 |

5832 = 2 x2 x 2 x 3x 3 x 3 x 3 x3 x 3
1000 = 2 x 2 x 2 x 5 x 5 x 5
Next tell them that we will take factor out of every 3 identical factors.
$\sqrt[3]{5832}$ = 2 x 3 x 3 = 18 and $\sqrt[3]{1000}$ = 2 x 5 = 10

So, $\frac{\sqrt[3]{5832}}{\sqrt[3]{1000}}$ = 18/10

Tell them to express 18/10 in decimal form as the question is in decimal.
So, 18/10 = 1.8
Encourage the students to ask questions if they need more explanation.

**Activity:**

Have students work in pairs. Ask them to solve Q3 of learning check 2.3 given on page 34-35 of textbook. Walk around the class, monitor their working and guide them where required.

**Sum Up:** **(3min)**

Sum up the lecture by retelling the steps of finding cube roots of decimals.

**Assessment:** **(5min)**

To assess students' learning, ask them solve Q2(p) of learning check 2.3 given on page 34-35 of textbook

**Homework:** **(2 min)**

Solve Q2(q and r) of learning check 2.3 given on page 34-35 of textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____
_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 5 **Lesson Plan: 3**

**Unit Name:** Square roots and Cube Roots **Topic:** Unit check **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 2 by solving Q1-5 of Unit Check Exercise.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 35-36.

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Tell students that they are going to revise all the concepts of the Unit Square roots and Cube Roots.

Ask them the different questions that are related to the unit

**Main Activities/Concept Building: (30 min)**

**Activity:**

Have students open page 35-36 of their textbooks. Ask them to solve Q1 to Q3 of “Unit check 2” of their textbooks. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Sum Up: (3 min)**

Sum up the lesson by repeating the important points of unit using sum up.

**Assessment: (0 min)**

N/A

**Homework: (2 min)**

Solve Q4 and 5 of Unit check 2 given at page 35 of their textbooks.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 5 **Lesson Plan: 4**

**Unit Name:** Square roots and Cube Roots **Topic:** Unit check **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 1 by solving Q6-9 of Unit Check Exercise and by completing "work with math" activity.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 35-36.

**Teaching & Learning Activities:**

## Opening Activities/Warm-up: (5 min)

Say, "Assalaamu Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Tell students that they are going to revise all the concepts of the Unit Square roots and Cube Roots.
Ask them the different questions that are related to the unit

## Main Activities/Concept Building: (30 min)

**Activity:**

Have students open page 35-36 of their textbooks. Ask them to solve Q6(a – b) of "Unit check 2" of their textbooks. Walk around the class and appreciate them for the correct solutions. Guide them if required.

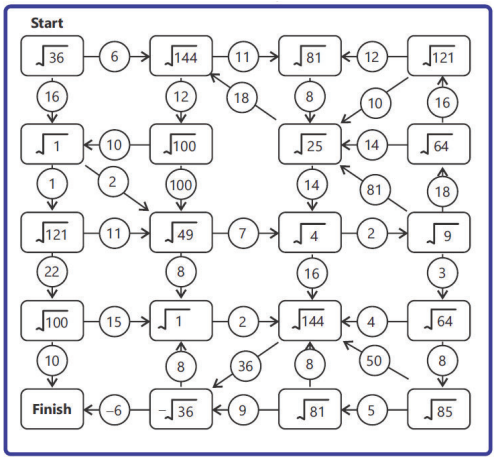
Tell students that now we are going to do an activity of 'work with math' on page 27.

Work in pairs.

— Each pair will be provided with a unique maze sheet (as the one shown in the picture) containing
questions regarding square root and cube roots.

— The members of each pair will calculate them and colour the correct path toward the end.

— The pair with the most accurate solutions completed in the shortest amount of time wins.




## Sum Up: (3 min)

Sum up the lesson by repeating the important points of unit using sum up.

## Assessment: (0 min)

N/A

## Homework: (2 min)

Solve Q6(c to h), Q7-8-9 of Unit check 2 given at page 36 of their textbooks.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 5 **Lesson Plan:** 5

**Unit Name:** Real Numbers **Topic:** Revision **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(3 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Real Numbers”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Worksheet**

**Name: _____** **Date: _____**

**1. Identify the terminating and non-terminating decimal numbers and give reason.**

a) 3.141567….. b) 0.18 c) 1.376364… d) 2.1

**2. Represent** 2.5, - 0.5, ½, 5/6, $\sqrt{5}$ **on a number line.**

**3. Round off the following to the specified number of significant figures.**

a) 67245 to 3 significant figures
b) 23.781 to 2 significant figures
c) 89234.823 to 5 significant figures
d) 892314 to 4 significant figures

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 5 **Lesson Plan:** 6

**Unit Name:** Square Roots and Cube Roots **Topic:** Revision **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(3 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Square Roots and Cube Roots”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Worksheet**

**Name: _____** **Date: _____**

**1. Write the base, index and value of each of the following expressions:**

a) $6^3$ b) $3^5$ c) $4^4$

**2. Write the following products in index notation form and find the value..**

a) 3×3 x 3 × 2 b) ½ x ½ x ½ x ¼ x ¼

**3. Apply the laws of exponents to simplify the following expressions**

a) $6^6 \times 6^8$ b) $4^2 \times 7^2$ c) $2^3 \div 4^3$ d) $3^5 \div 3^3$ e) $[(\frac{2}{4})^3]^2$

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit:** 1 **Week:** 5 **Lesson Plan:** 7

**Unit Name:** Square roots and Cube Roots **Topic:** Revision **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(3 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Square Roots and Cube Roots”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

## Worksheet

**Name: _____** **Date: _____**

1. **Find the square root of 178929.**

2. **Find the cube root of 39304.**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 1

**Unit Name:** Financial arithmetic **Topic:** Proportion **Date**: _____

## Objective(s):

**At the end of this period, the students will be able to:**

Calculate direct proportion and solve real-world word problems related to it.

## Resource Material:

Chalk/Marker, White/Blackboard, Textbook page 38-40 and 43

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (8 mins)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work.

Have students open textbook at page 38. Quickly recall the concepts related to questions given in rapid recall. Then ask them to solve those questions. Read the opening page question and tell them that we will be able to solve it after learning about the concepts of the unit.

(***Note for teachers:*** *The sections "Think out of the box", "Talk over and write" and "Technology corner" are supplementary exercises. These can also be given to students who finish their work quickly or are fast learners.)*

**Main Activities/Concept Building: (22 mins)**

Before the main concept, tell them briefly about the unit outline and its real life relevance. Recall with students the concept of proportion that is equality of two ratios. There are four terms in a proportion, the first and fourth terms of the proportion are called extremes and the second and third terms are called means. Tell students today we will learn about type of proportion that is called direct proportion. Ask students: Do you know about direct proportion. Take their responses and appreciate if someone gives the right answer. Tell them that in our daily life we experience many situations when we compare the quantities that changes in the same directions and at constant ratio. Tell them that when we increase the speed of the car we covered more distance and when we slower the speed we cover less distance. Similarly we do more work in more time and less work in less time. This means that as one quantity increases, the other quantity also increases, and as one quantity decreases, the other quantity decreases by the same factor. This type of proportion is called direct proportion. Ask students to open their textbook page 39. Instruct students to learn about directly proportion. For more clarification solve worked example 1 and 2 on the board given at page 39 and 40. Explain each step to them and instruct to ask question where they find any confusion.

**Activity 1:**

Ask students to open their textbook page 43. Write the statement of the Q2 on the board. Call a student to the front of the class and ask him/her to read the statement and tell what is given and what we have to find. Then instruct to solve it on the board step by step and ask the rest of the class to observe the solution of the question and correct if needed. After that ask students to solve Q5 of "Learning check 3.1' given at page 43 of their textbook. Walk around and check their work and guide where required.

**Sum Up: (3min)**

Sum up the lesson by retelling students about the direct proportion and its use in our daily life by giving real-life examples.

**Assessment: (5 min)**

Assess students' understanding by asking them to solve 'pause and try' given on page 40 of textbook.

**Homework: (2 min)**

Solve Q7 of "Learning check 3.1" given at page 43 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 2

**Unit Name:** Financial Arithmetic **Topic:** Proportion **Date**: _____

## Objective(s):

**At the end of this period, the students will be able to:**

Calculate inverse proportion and solve real-world word problems related to it.

## Resource Material:

Chalk/Marker, White/Blackboard, Textbook page 39, 40 and 43

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins**

Say, “Assalaamu Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Ask students about their previous day. Begin the lesson by asking students what is meant by proportion. What is meant by extremes and means? What is meant by direct proportion? Take their responses and ask from random students to tell the real-life examples where we use direct proportion. Take their responses and appreciate them for their correct answers.

**Main Activities/Concept Building:** **(27 min)**

Tell students today we will learn about type of proportion that is called inverse proportion. Ask students: Do you know about inverse proportion. Take their responses and appreciate if someone gives the right answer. Tell them that in our daily life we experience many situations when we compare the quantities that changes in the opposite directions. Tell them that when the travelling time decrease speed of car increase and when speed is slower the travelling time increases. Similarly number of workers and work changes in opposite direction but the product is the same. This means that as one quantity increases, the other quantity decreases, and as one quantity decreases, the other quantity increases. This type of proportion is called inverse proportion. Ask students to open their textbook page 39. Instruct students to learn about inversely proportion. For more clarification solve worked example 3 given at page 40. Explain to them if 12 men complete the construction of a wall in 6 days, tell them that if the men increase it means the number of days to complete the wall decreases. So, here is the inverse proportion between time and workers. Explain each step to them and instruct to ask question where they find any confusion. Solve different real-life example of inverse proportion on the board and explain each step to them.
Ask students to open their textbook page 43. Write the statement of the Q1 on the board. Call a student to the front of the class and ask him/her to read the statement and tell what is given and what we have to find. Then instruct to solve it on the board step by step and ask the rest of the class to observe the solution of the question and correct if needed. After that ask students to solve Q3 and 4 of “Learning check 3.1’ given at page 43 of their textbook. Walk around and check their work and guide where required.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students about the inverse proportion and its use in our daily life by giving real-life examples. Also explain “Note to Remember” given at page 39 of their textbook.

**Assessment:** **(3 min)**

Assess students’ understanding by asking them to solve ‘pause and try’ given on page 40 of textbook.

**Homework:** **(2 min)**

Solve Q6, Q8 and Q10 of “Learning check 3.1” given at page 43 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 3

**Unit Name:** Financial Arithmetic **Topic:** Proportion **Date:** _____

## Objective(s):

**At the end of this period, the students will be able to:**

Represent direct proportion using graphs.

## Resource Material:

Chalk/Marker, White/Blackboard, textbook page 41-43, a big graph paper, ruler

## Teaching & Learning Activities:

### Opening Activities/Warm-up: (5 min)

Say, "Assalaamu Alaikum" and start with the name of Allah.

Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work.

Begin the lesson by asking students about their homework. Ask students: what is meant by direct proportion? Take their responses and make small groups of students and instruct them to write the example of direct proportion after completing the task they share their example with each other.

### Main Activities/Concept Building: (20 min)

Have students open their textbook page 41. Recall with students what is proportion and types of proportion. Ask students what is meant by direct proportion. Take their responses and tell them that with increase in one quantity the other quantity increase and with the decrease in one quantity the other quantity decreases. Tell students today we will learn about how to represent the direct proportion by using graph. Tell them that in direct proportion as the quantities are changes at constant ratio in the same direction so, if x and y are two quantities then we can show the direct proportion between x and y as:

$y \propto x$ (where $\propto$ symbol of proportionality) or $y = kx$ (where k is the constant of proportionality)

To show the direct proportion by using graph ask students to read the statement of the worked example 1 on page 41. Tell them that as Madiha reads 2 pages of the storybook. By reading statement we came to know that by increasing number of days, number of pages she read of the storybook also increases so the number of pages is directly proportion to the number of days.

The number of days = x The number of pages = y

Here, $y \propto x$.

So, we can write this relation as: $y = kx$ or $y = 2x$ (where 2 is the constant of proportionality as she read 2 pages daily)

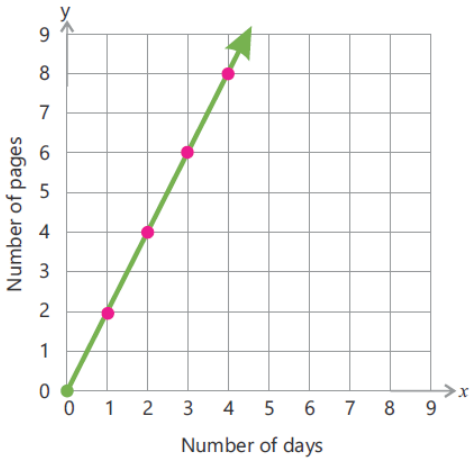
We will find a few pairs of numbers for x and y which satisfy the equation $y = 2x$.

Put x = 0 in y = 2x; $y = 2(0) = 0$ Put x = 1 in y = 2x; $y = 2(1) = 2$

Put x = 2 in y = 2x; $y = 2(2) = 4$ Put x = 3 in y = 2x; $y = 2(3) = 6$ Put x = 4 in y = 2x; $y = 2(4) = 8$

Tell students now we draw a table for x and y values and then we show these values on the graph. Paste a big graph paper on the board and then show number of days along x-axis and number of pages along y-axis and then show the values of x and y on the graph and explain each and every step to students. Instruct students to ask question where they find any confusion.

| $x$ (No. of days) | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| y (No. of pages) | 0 | 2 | 4 | 6 | 8 |



Now by pointing towards the graph tell them that as the graph we get is the straight line, it means when the value of y increases then x increases and y decreases then x decreases so, showing the direct proportion. Explain the whole process of drawing graph for direct proportion once again to more clarification of students who feel confusion.

**Sum Up:** **(3 min)**

Sum up the lesson by re-telling students about direct proportion and how to draw graph for direct proportion. Explain "Note to Remember" given at page 41 of their textbook.

**Assessment:** **(10 min)**

To assess students write real-life example of direct proportion and ask students to show this by using graph paper.

**Homework:** **(2 min)**

Solve Q11 part a given at textbook page 43.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 4

**Unit Name:** Financial Arithmetic **Topic:** Proportion **Date**: _____

## Objective(s):

### At the end of this period, the students will be able to:

Represent inverse proportion using graphs.

### Resource Material:

Chalk/Marker, White/Blackboard, textbook page 42-43, big graph paper, pencil

## Teaching & Learning Activities:

### Opening Activities/Warm-up: (5 min)

Say, "Assalaamu Alaikum" and start with the name of Allah.
Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work.
Begin the lesson by asking students about their homework. Ask students: what is meant by inverse proportion? Take their responses and make small groups of students and instruct them to write the example of inverse proportion after completing the task they share their example with each other.

### Main Activities/Concept Building: (20 min)

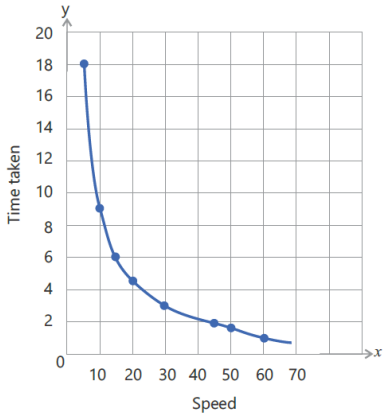
Have students open their textbook page 42. Recall with students what is proportion and types of proportion. Ask students what is meant by inverse proportion. Take their responses and tell them that with increase in one quantity the other quantity decreases and with the decrease in one quantity the other quantity increases. Tell students today we will learn about how to represent the inverse proportion by using graph. Tell them that in inverse proportion as the quantities are changes at opposite direction so, if x and y are two quantities then we can show the inverse proportion between x and y as:

$y \propto 1/x$ (where $\propto$ symbol of proportionality) or $y = k/x$ (where k is the constant of proportionality)

To show the inverse proportion by using graph ask students to read the statement of the worked example on page 42. Tell them that as relationship between the speed of a vehicle and the time taken to cover a distance. By increasing the speed of the vehicle the time taken to cover the distance is decreases and by decreasing the speed of the vehicle the time to cover the distance is increased. This shows that speed and time is inversely proportional to each other.

Speed of the vehicle = x time taken by the vehicle = y

Tell students the table given in the textbook shows the values of x and y and then we show these values on the graph. Paste a big graph paper on the board and then show speed along x-axis and time taken along y-axis and then show the values of x (speed) and y (time taken) on the graph and explain each and every step to students. Instruct students to ask question where they find any confusion.




Now by pointing towards the graph tell them that as the graph we get is the curved, it means when the value of y increases then x decrease and y decreases then x increases so, showing the inverse proportion. Explain the whole process of drawing graph for inverse proportion once again to more clarification of students who feel confusion.

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Sum Up:** **(3 min)**

Sum up the lesson by re-telling students about inverse proportion and how to draw graph for inverse proportion. Explain "Note to Remember" given at page 42 of their textbook.

**Assessment:** **(10 min)**

To assess students write real-life example of inverse proportion and ask students to show this by using graph paper.

**Homework:** **(2 min)**

Solve Q11 part b given at textbook page 43.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 5

**Unit Name:** Financial Arithmetic **Topic:** Compound proportion **Date:** _____

## Objective(s):

### At the end of this period, the students will be able to:

Identify the concept and rules for compound proportion through examples.

## Resource Material:

Chalk/Marker, White/Blackboard, textbook page 44

## Teaching & Learning Activities:

### Opening Activities/Warm-up: (5 min)

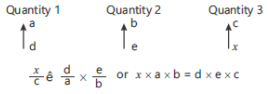
Say, "Assalaam u Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Begin the lesson by asking students about their homework. Recall with students what is meant by proportion and its type. Tell students we know that the proportion is the equality of two ratios. There are two types of proportion one is the direct proportion and the other one is inverse proportion. Tell students today we will learn more about proportion.

### Main Activities/Concept Building: (25 mins)

Ask students to open their textbook page 44. Tell students today we will learn about compound proportion. Ask students: Do you know about compound proportion? Take their responses and appreciate if someone gives the right answers. Tell students we know that the equality of two ratios is called proportion whereas the compound proportion is relationship between two or more proportions. Provide a visual representation of compound proportion using an example. For instance, if a : b = c : d and c : d = e : f, then a : b = e : f. Explain that compound proportion helps us solve problems that involve multiple quantities and their relationships. Tell students there are some rules that are used in compound proportion. Write the example on the board as:

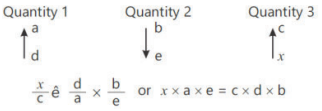
**A bakery can bake 120 loaves of bread in 3 hours using 4 ovens. If they want to increase their production and use 6 ovens, how long will it take them to bake 180 loaves of bread?**

Ask students to read the statement of the example. Tell them that if 120 loaves of are baked in 3 hours then to bake 180 loaves of bread we need more time. 3 ovens baked 120 loaves and to bake more loaves more ovens are needed. This shows that the number of ovens and the time it takes to bake the bread are directly proportional to the number of loaves produced. So the rule 1 is if quantity 1 and quantity 3 are directly proportional, and quantity 2 and quantity 3 are also directly proportional, then we use this rule:



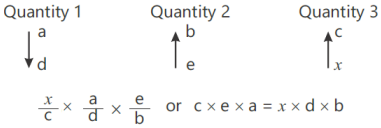

Now write another real-life example **"If a car travels 150 kilometers in 2 hours, how long will it take to travel 300 kilometers at a speed twice as fast?"**

Explain this example to students and tell them that the speed of a car is directly proportional to the distance traveled as by increasing speed the distance travelled by the car also increase, but inversely proportional to the time taken as by increasing speed of the car the time taken to cover the distance is decrease. So tell students to solve such type of real-life examples the rule of compound proportion is: If quantity 1 and quantity 3 are directly proportional but quantity 2 and quantity 3 are inversely proportional:



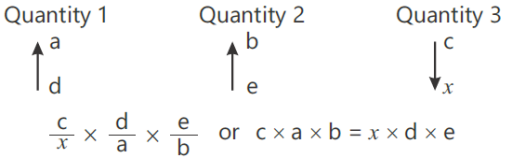

Now write another real-life example **"If 8 workers can complete a task in 6 hours, how many workers are needed to complete the same task in 3 hours?"**

Explain this example to students and tell them that the speed of a car is directly proportional to the distance traveled as by increasing speed the distance travelled by the car also increase, but inversely proportional to the time taken as by increasing speed of the car the time taken to cover the distance is decrease. So tell students to solve such type of real-life examples the rule of compound proportion is: If quantity 1 and quantity 3 are inversely proportional but quantity 2 and quantity 3 are directly proportional, then we use this rule




Now write another real-life example **"If 5 students take 8 hours to complete three paintings, how many hours are needed to complete 5 paintings if the number of students decreases by 2?"**

Explain this example to students and tell them that the number of students and time taken to complete the task in inversely proportional when students decreases it means the time to complete the task is increases. Number of students and paintings are also inversely



proportional to each other. So tell students to solve such type of real-life examples the rule of compound proportion is: If quantity 1 and quantity 3 are inversely proportional, and quantity 2 and quantity 3 are also inversely proportional, then we use this rule:

Explain the rules of compound proportion by giving the examples and instruct students to ask questions if they found any difficulty.

**Activity:**

Make four groups of students. Assign each group one rule. Instruct them to make one real-life example of the rule that is assign to them. Walk around and check their work and guide them where required.

**Sum Up: (3 min)**

Sum up the lecture by repeating the rules of compound proportion with students.

**Assessment: (5 min)**

To assess students write an example of compound proportion on the board and ask students to read the example and tell which rule apply on this example.

**Homework: (2 min)**

Revise the rules of the compound proportion.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 6

**Unit Name:** Financial Arithmetic **Topic:** Compound Proportion **Date**: _____

## Objective(s):

### At the end of this period, the students will be able to:

Calculate compound proportion and solve real-world word problems related to it.

### Resource Material:

Chalk/Marker, White/Blackboard, textbook page 44 and 45

## Teaching & Learning Activities:

### Opening Activities/Warm-up: (8 min)

Say, “Assalaam u Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Begin the lesson by asking students about they have learnt in previous lesson. Ask students: What is compound proportion? What is the difference between proportion and compound proportion? Ask students about the rules of the compound proportion. Take their responses and recall with them the rules of the compound proportion.

**Main Activities/Concept Building: (20 mins)**

Before starting the concept recall with students the concept of direct and inverse proportion. Then begin the lesson by explaining the concept of compound proportion as a mathematical relationship where two or more quantities are directly or inversely proportional to a common third quantity. Instruct students to open their textbook page 45 and read the statement of the worked example. Ask students after reading the statement tell what is given and what we have to find. Take their responses and tell them that as number of people decreases it means the flour the consume also decreases so, flour and number of people are directly proportional to each other. Now observe the number of days and the quantity of flour. As the number of days increases from 25 to 30 this shows that the flour they used also increased. This shows that flour and the days are also directly proportion to each other. Tell students in this example rule 1 of compound proportion is used. Now solve the example step by step on the board and explain each step to them.

| Persons | Days | Flour (kg) |
|---|---|---|
| 30 ↑ | 25 ↑ | 20 ↑ |
| 15 | 30 | $x$ |

**Activity:**

Have students open textbook page 45. Write statement of Q1 and Q2 on the board. Solve it on the board by asking students to tell rules of compound proportion which apply on these questions and the steps of solving it. Appreciate them for their correct steps. Then ask students to copy the solution on their notebook and ask questions if they are not clear about anything.

**Sum Up: (3 min)**

Sum up the lecture by repeating with students, how to calculate the compound proportion by following the rules of the compound proportion given at page 44.

**Assessment: (7 min)**

To assess students ask them to solve Q3 and Q4 of “Learning check 3.2” given at textbook page 45. Walk around and check their work and correct them where required.

**Homework: (2 min)**

Solve Q3 and Q4 of “Learning check 3.2” given at textbook page 45.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 7

**Unit Name:** Financial Arithmetic **Topic:** Profit and Loss percentage **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Explain and calculate profit percentage and loss percentage.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 46, 47 and 48

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaam u Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Begin the lesson by asking students about their homework. Ask students: What they know about cost price, selling price, profit and loss? Take their responses and appreciate students for their correct answer.

**Main Activities/Concept Building:** **(22 mins)**

Ask students open their textbook page 46. Tell students today we will learn to calculate the percentage profit and loss. Explain students that the price of goods or items at which they are purchased by a shopkeeper or wholesaler from the manufacturer is known as the cost price. The short form we use for cost price is CP. Tell them that the selling price of goods or items is the price at which they are sold to the customer by a wholesaler or a shopkeeper.

Tell students if the selling price of the things are greater than its cost price then we can say that there is a profit but if the cost prices of the things are greater than its selling price then we can say it is a loss. Ask students to learn about the cost price, selling price, profit and loss given at page 46 of their textbook. Explain to them how to calculate the profit, percentage profit, loss and percentage loss by writing formulas on the board and explain it to them. Instruct students to read the statement of the worked example 1 and tell what is given and what we have to find. Take their responses and tell them that cost price and selling price of the book is given and we have to find the percentage profit. Solve the example step by step on the board and explain each step to them. For more clarification of the concept solve the worked example 2 on the board and instruct to ask questions where they feel any confusion.

**Activity:**

Ask students to solve Q1 and Q2 of Learning check 3.3 given on page 48 of textbook. Walk around the class and monitor their work. Guide them if necessary.

**Sum Up:** **(3 min)**

Sum up the lecture by retelling about the cost price, selling price, profit and loss by giving different real-life examples.

**Assessment:** **(8 min)**

To assess students ask them to solve “pause and Try” given at page 46 and Q3 of “Learning check 3.3” given at page 48 of textbook.

**Homework:** **(2 min)**

Solve Q4 and Q5 of “Learning check 3.3” given at page 48 of textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 1

**Unit Name:** Financial Arithmetic **Topic:** Discount **Date**: _ _____

## Objective(s):

**At the end of this period, the students will be able to:**

Explain and calculate discount and discount percentage.

## Resource Material:

Chalk/Marker, White/Blackboard, textbook page 47-49

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (8 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Begin the lesson by asking students about their homework. Ask students: What is meant by cost price and selling price? How we can calculate percentage profit or loss? Take their responses and then call a student to the front of the class and ask him/her to write an example of finding percentage profit. Ask the rest of the class to check his/her work and correct if needed.

**Main Activities/Concept Building: (20 min)**

Tell students today we will learn about discount and percentage discount. Ask students to open their textbook page 47. Ask if they have encountered discounts while shopping or have seen advertisements with discounted prices. Tell them that during holiday seasons or clearance events, stores often offer discounts on clothing, electronics, or home goods. For example, discounts on winter clothing at the end of winter. Tell students the original price of the item or object is called the marked price and the difference between selling price and marked price is called discount. Instruct students to read the statement of worked example 1 and ask them what is given and what we have to find. Take their responses and tell them that as the marked price of a shirt and percentage discount is given and we have to find the actual selling price of the shirt. Now first find the discount price by finding 20% of 450 and then we find the selling price by subtracting the discount price from the marked price. Solve the example step by step on the board and explain each step to them. Instruct students to ask questions if they found any confusion. For more clarification solve worked example 2 on the board and explain it to them.

**Activity:**

Ask students to solve Q6 and Q7 of Learning check 3.3 given on page 48 of textbook. Walk around the class and monitor their work. Guide them if necessary.

**Sum Up: (3 min)**

Sum up the lecture by retelling students about marked price, selling price and discount by giving real-life examples.

**Assessment: (7 min)**

To assess students ask them to solve “pause and Try” given at page 48 and Q8 of “Learning check 3.3” given at page 49 of textbook.

**Homework: (2 min)**

Solve Q9 and Q10 of “Learning check 3.3” given at page 49 of textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 2

**Unit Name:** Financial Arithmetic **Topic:** Markup **Date:** _____

## Objective(s):

**At the end of this period, the students will be able to:**

Identify profit/markup, principal amount and markup rate.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 49

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaam u Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students to define the terms cost price, selling price, profit, loss, discount. Take their responses and ask students to make example of where we find percentage profit or loss or discount. Walk around and check their work and guide where required.

**Main Activities/Concept Building:** **(25 mins)**

Tell students today we will learn about what is meant by markup, principle amount and markup rate. Ask students to open their textbook page 49. Begin the lesson by asking students if they have heard the terms profit or markup before. Discuss briefly what they think these terms mean. Explain that profit and markup are common concepts used in our daily life to determine the selling price of goods or services. Tell students profit is the difference between the selling price and the cost price of an item. Explain that profit is the amount earned when an item is sold at a higher price than its cost. Tell students when someone borrows money from bank or any other resource he has to pay an extra amount when repaying the borrowed amount. That extra amount is called markup. Tell students when services or goods are sold to customers by the seller, he must charge a price greater than the actual cost of the goods or services in order to earn a profit the amount by which they increase the price is called the markup. Tell students the amount that someone borrowed is called principal amount, the additional amount that is repaid by a borrower to the lender is known as markup, markup rate, also known as markup percentage, is the percentage increase added to the cost price of a product or service to determine its selling price. It represents the proportion of profit or margin included in the selling price. Ask students to open their textbook page 49 and learn more about markup, markup rate and principal amount. Write the formula to find the markup on the board and explain it to students. Tell students if A is denoted as the amount to be paid in the future, then: A = Principal Amount + Markup

$$\text{Markup} = \frac{\text{Principal amount} \times \text{Rate of markup} \times \text{Time duration}}{100}$$

$$\text{Markup} = \frac{P \times R \times T}{100}$$

$$A = P + \text{Markup} \quad \Rightarrow \quad \text{Markup} = A - P$$

Instruct students to ask questions if they found any difficulty. Give different real life example to students about markup for more clarification.

**Sum Up:** **(3 min)**

Sum up the lecture by retelling about markup, markup rate and principal amount. Explain students "Note to Remember" given at page 49 of their textbook.

**Assessment:** **(5 min)**

To assess students ask students: what is meant by markup? What is meant by markup rate? What is the principal amount? Take their responses and appreciate if someone gives the right answer.

**Homework:** **(2 min)**

Revise the classwork.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 3

**Unit Name:** Financial Arithmetic **Topic:** Markup **Date**:

## Objective(s):

**At the end of this period, the students will be able to:**

Calculate profit/markup, principal amount and markup rate.

## Resource Material:

Chalk/Marker, White/Blackboard, textbook page 49-51

## Teaching & Learning Activities:

**Opening Activities/Warm-up: (5 min)**

Say, "Assalaam u Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Begin the lesson by asking students what they have learnt previous day. Ask students: What is meant by markup, markup rate and principal amount? Take their response and then ask them to given real-life example where they use markup. Appreciate them for their correct examples.

**Main Activities/Concept Building: (25 mins)**

Tell students today we will learn to calculate markup, principal amount and markup rate. Recall with students the mark up is the additional amount that a borrower pays when he repay the borrowed amount, the amount that a borrower borrow is the principal amount and rate of markup is the percentage amount that is added to the principal amount as markup. Tell students if P is the principal amount, T is the time period for which an amount is borrowed, R is the rate of markup, then the formula for calculating the amount of markup will be:

$$\text{Markup} = \frac{\text{Principal amount} \times \text{Rate of markup} \times \text{Time duration}}{100}$$

$$\text{Markup} = \frac{P \times R \times T}{100}$$

Ask students to read the statement of the worked example 1 and tell what are given and what we have to find. Take their responses and tell them that we have to find markup whereas principal amount Rs 80000 is given that is borrowed for 5 years and rate of markup per annum is 7%. Write the formula on the board for finding markup and put the values of the given quantities and find the markup step by step and explain each step to them. Encourage the students to ask questions if they need more explanation. For more clarification solve the worked example 2 and 3 given at page 50 of their textbook on the board step and step and explain the steps where they found confusion or difficulty to understand.

**Activity:**

Ask students to solve Q1, Q2 and Q3 of "Learning Check 3.4" given on page 50 of textbook. Walk around the class and monitor their work. Guide them if necessary.

**Sum Up: (3 min)**

Sum up the lecture by retelling about the how to calculate the markup, markup rate and principal amount by giving different examples.

**Assessment: (5 min)**

To assess students ask them to solve Q4 and Q5 of "Learning Check 3.4" given on page 50 and 51.

**Homework: (2 min)**

Solve Q6-Q8 of "Learning Check 3.4" given on page 50 and 51.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 4

**Unit Name:** Financial Arithmetic **Topic:** Insurance **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Explain and solve problems involving insurance.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 51, 52 and 54

## Teaching & Learning Activities:

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaam u Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Begin the lesson by asking students about their homework. Ask students: how to calculate markup, markup rate and principal amount, time period for which amount is borrowed. Call a student to the front of th e class and ask him/her to write the formal to find the markup. Ask the rest of the class to check and tell is he/she correct or not. Appreciate him/her for writing correct formula to find the markup.

**Main Activities/Concept Building:** **(25 mins)**

Begin the lesson by asking the students if they have heard of insurance and what they think it means. Engage in a class discussion about the purpose and importance of insurance, prompting questions such as "Why do people get insurance? What are some things that can be insured?" after taking their responses tell them that Insurance is a contract in which an individual or organization pays a premium to an insurance company in exchange for financial protection against specified risks or losses. Discuss with students about common types of insurance (e.g., vehicle insurance, life insurance, homeowner's insurance) and briefly explain their purposes. Ask students to open their textbook page 51 and learn more about insurance. Now ask students to read the worked example 1 given at page 51 of their textbook and ask what is given and what we have to find. Take their responses and tell them that we have to find the amount of premium at the rate of 3% if Akram insured his life for Rs 800,000. Tell students an insurance policy creates a contract between the insured and the insurer. According to this contract, the insured is bound to pay an amount in the form of installments (monthly, quarterly, or yearly). These installments are called premium and we have to find the premium in the worked example 1. Then write the formula to find the amount of premium that is:

Amount of premium = rate/100 x total amount of policy

Solve the example step by step on the board and explain each step to them. Encourage students to ask questions if they more explanation. For more explanation solve the worked example 2 given at page 52 of their textbook on the board step by step that is related to the vehicle insurance.

**Activity:**

Have students open textbook page 54. Write statement of Q1 and Q2 on the board. Solve it on the board by asking students to tell the steps of solving it. Appreciate them for their correct steps. Then ask students to copy the solution on their notebook and ask questions if they are not clear about anything.

**Sum Up:** **(3 min)**

Sum up the lecture by retelling about the insurance and how to solve problem related to insurance.

**Assessment:** **(5 min)**

To assess students ask them to solve Q3 of “Learning Check 3.5” given on page 54 of their textbook. Walk around and check their work and guide them where required.

**Homework:** **(2 min)**

Solve Q4 of “Learning Check 3.5” given on page 54 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 5

**Unit Name:** Financial Arithmetic **Topic:** Partnership **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Explain and solve problems involving partnership.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 52, 53 and 54

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 mins)**

Say, “Assalaam u Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Begin the lesson by asking students about their homework. Ask students: What is meant by insurance? Which type of insurance you learn? What is meant by premium? Take their responses and recall with them these terms.

**Main Activities/Concept Building: (25 mins)**

Tell students today we will learn about partnership. Begin the lesson by asking the students if they have heard of a partnership and what they think it means. Engage in a class discussion about partnerships, prompting questions such as "What do you think a partnership is? Why do you think people form partnerships?" After taking their responses tell them that a partnership is a business structure where two or more individuals called partners agree to share the responsibilities, resources, and profits or loss according to their shares of a business. Ask students to open their textbook page 52 and learn more about partnership.
Ask students to read the statement of the worked example 1 given at textbook page 52 and ask them what is given and what we have to find. Take their responses and tell them that two people start business and share their amounts and after 4 months third person join them with an investment of 60,000. After one year they made profit of Rs 85,000 and we have to find the share of each in profit. Now solve the examples step by step on the board and explain each step to them. Encourage them to ask question for more explanation. For more clarification give more examples from daily life where different people starts business by sharing their amount and share profits according to their amount of investment.

**Activity:**

Have students open textbook page 54. Write statement of Q5 on the board. Solve it on the board by asking students to tell the steps of solving it. Appreciate them for their correct steps. Then ask students to copy the solution on their notebook and ask questions if they are not clear about anything.

**Sum Up: (3 min)**

Sum up the lecture by retelling about the insurance and how to solve problem related to insurance.

**Assessment: (5 min)**

To assess students ask them to solve Q6 of “Learning Check 3.5” given on page 54 of their textbook. Walk around and check their work and guide them where required.

**Homework: (2 min)**

Solve Q7 of “Learning Check 3.5” given on page 54 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 6

**Unit Name:** Financial Arithmetic **Topic:** Inheritance **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Explain and solve problems involving inheritance.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 53 and 54

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, “Assalaam u Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Begin the lesson by asking students about their homework. Ask students to tell about significant figures and the rules to round off. Write a random number on board and ask students to round it off to nearest 10, 100 or 1000. Appreciate students for correct answers.

**Main Activities/Concept Building:** **(25 mins)**

Begin the lesson by discussing the importance of inheritance in society and family relationships. Engage in a class discussion about inheritance, prompting questions such as "What is inheritance? Why is it important in Islam?" After taking their responses tell them that Inheritance is the distribution of a deceased person's property and assets among their heirs according to the guidelines provided in Islamic law. Discuss the key principles of Islamic inheritance, including the obligatory shares of each person of the family. Tell them that according to Islam the share of widow is 1/8 of the whole property, the share of the daughter is the half of the share of the son. Emphasize the fairness, balance, and social justice aspects of Islamic inheritance. Ask students to open their textbook page 53 and learn more about inheritance. For more explanation ask students to read the statement of the worked example given at textbook page 53 and tell what is given and what we have to find. Take their responses and tell them that property value of deceased person is given and we have to find the share of his widow, one son and one daughter. Now solve this on the board step by step and explain each step to them. Encourage them to ask question if they found any confusion. For more clarification give different real-life examples.

**Activity:**

Divide the students of the class into small groups. Assign each group to write one real-life example of inhertitance and solve step by step on the board. after completing the task share their problems with each other and correct each other where needed in class discussion. Appreciate them for their good work and actice participation in class discusssion.

**Sum Up:** **(3 min)**

Sum up the lecture by retelling about the insurance and how to solve problem related to insurance.

**Assessment:** **(5 min)**

To assess students ask them to solve Q8 of “Learning Check 3.5” given on page 54 of their textbook. Walk around and check their work and guide them where required.

**Homework:** **(2 min)**

Solve Q9 of “Learning Check 3.5” given on page 54 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 7

**Unit Name:** Financial Arithmetic **Topic:** Converting Currencies **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Convert Pakistani currency to well-known international currencies and vice versa.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 54-56

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, “Assalaam u Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Begin the lesson by asking students about their homework. Ask students what is meant by inheritance? What is the share of son, daughter and the widow in the property of deceased person according to Islam? Take their responses and appreciate them for their correct answer.

**Main Activities/Concept Building:** **(25 mins)**

Begin the lesson by discussing the importance of currency conversion in a globalized world. Engage in a class discussion about currency conversion, prompting questions such as "What is currency conversion? Why is it necessary when dealing with international transactions?" Explain the concept of currency conversion: "Currency conversion is the process of converting the value of one currency to another currency based on exchange rates." Introduce the idea that exchange rates fluctuate over time and may vary between different currency pairs. Choose a well-known international currency, such as the US dollar (USD), and explain its value in relation to the Pakistani currency (Pakistani Rupee - PKR). Ask students to open their textbook page 55 and convert the 345 Pakistani Rupees to United States Dollars given in worked example 1 according to the currency rate as given in textbook. Demonstrate the calculations step-by-step, using the current exchange rate as a reference. To convert the United State Dollar to Pakistani rupee solved the worked example 2 on the board and explain it them. To convert other currency like British Pound Sterling to Pakistani Rupee or Pakistani rupee to British Pound Sterling solve worked example 3 and 4, Canadian dollar to Pakistani rupee or Pakistani rupee to Canadian Dollar solve worked example 5 and 6 on the board and explain the calculation step by step, using currency exchange rate as reference as given in the textbook. Instruct students to ask questions if they have any difficulty in calculating the currency conversion.

**Activity 1:**

Make three groups of students. Assign each group one currency (USD, CAD and GBP). Provide each group paper slips of Pakistani currency and the currency that assign to them. Ask them to convert the Pakistani currency to that currency and that currency to Pakistani currency. Walk around and check their work and guide them where required.

**Sum Up:** **(3min)**

Summarize the key points covered in the lesson, emphasizing the concept and importance of currency conversion.

**Assessment:** **(5 min)**

To assess students ask them to solve Q1 of “Learning Check 3.6” given at page 56 of their textbook.

**Homework:** **(2 min)**

Solve Q2 of “learning Check 3.6” given at textbook page 56.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 3 **Lesson Plan: 1**

**Unit Name:** Financial Arithmetic **Topic:** Unit check **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 3 by solving Q1-8 of Unit Check Exercise.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 57-58

**Teaching & Learning Activities:**

## Opening Activities/Warm-up: (5 min)

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Tell students that they are going to revise all the concepts of the Unit Financial Arithmetic.

Ask them the different questions that are related to the unit.

## Main Activities/Concept Building: (30 min)

**Activity:**

Have students open page 57 and 58 of their textbooks. Ask them to solve Q1 to Q6 of “Unit check 3” of their textbooks. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Sum Up:** **(3 min)**

Sum up the lesson by repeating the important points given in Sum-Up of the unit given at page 57.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Solve Q7-8 of Unit check 3 given at page 58 of their textbooks.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 3 **Lesson Plan: 2**

**Unit Name:** Financial Arithmetic **Topic:** Unit check **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 3 by solving Q9-13 of Unit Check Exercise and by completing "work with math" activity.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook pages 58-59

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Tell students that they are going to revise all the concepts of the Unit Financial Arithmetic.
Ask them the different questions that are related to the unit.

**Main Activities/Concept Building: (30 min)**

**Activity 1:**

Have students open page 58 of their textbooks. Ask them to solve Q9 to 11 of "Unit check 3" of their textbooks. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Activity 2:**

Tell students that now we are going to do an activity of 'work with math' on page 59.

- Work in groups.
- Each group will draw one table and equation for direct proportion and one table and equation for inverse proportion on a piece of paper.
- Then they will exchange their paper with other groups.
- The groups will then draw a graph based on the information and interpret it.

**Sum Up: (3 min)**

Sum up the lesson by repeating the important points of the unit.

**Assessment: (0 min)**

N/A

**Homework: (2 min)**

Solve Q12-13 of Unit check 3 given at page 59 of their textbooks.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 3 **Lesson Plan: 3**

**Unit Name:** Sets **Topic:** Sets and its Notation **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Describe sets using language (tabular and descriptive notation).

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 60-62

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (8 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah.

Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work.

Have students open textbook at page 60. Quickly recall the concepts related to questions given in rapid recall. Then ask them to solve those questions. Read the opening page question and tell them that we will be able to solve it after learning about the concepts of the unit.

(***Note for teachers:*** *The sections "Think out of the box", "Talk over and write" and "Technology corner" are supplementary exercises. These can also be given to students who finish their work quickly or are fast learners.)*

## Main Activities/Concept Building: (20 min)

Before the main concept, tell them briefly about the unit outline and its real life relevance. Begin the lesson by telling students today we will learn about set and representation of sets. Ask students: Do you know the way to represent the sets. Take their responses and tell them that there are more than one ways to represent the sets. Tell them there are three ways to represent sets that are descriptive, tabular and set builder form. Today we will learn about tabular and descriptive form. Ask students to open their textbook page 61. Tell them that in descriptive form a set is represented in the form of statements using well-defined words. Explain the descriptive from by the worked examples given in the textbook. For example "A = set of composite numbers between 10 and 30. Tell them that as the statement is well-defined and distinct. So this set is in descriptive form. For more explanation solve the worked example given at page 61 of their textbook. Now tell them that when we write the elements of the sets in a curly brackets separated by commas. Then that form of a set is the tabular form. Explain it with the worked examples given in the textbook page 61 and 62. Instruct students to ask question where they found any confusion. For more explanation give more examples to represent sets in tabular and descriptive form.

**Activity 1:**

Make two groups of students. Give one group tabular form of set and instruct them to convert that tabular form to descriptive form. Give descriptive from to other group and instruct to convert them to tabular form. Walk around and check their work. After completing the work instruct them to exchange their work with each other. Instruct them to check the work of the other group and correct where required. Then discuss with them about their common mistakes.

**Sum Up: (3min)**

Sum up the lecture by recalling with students three forms of representing sets such as tabular form and descriptive form.

**Assessment: (7min)**

Ask them to solve "Pause and Try" on page 61. Walk around and check their work and guide them where required.

**Homework: (2 min)**

Revise the classwork.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 3 **Lesson Plan:** 4

**Unit Name:** Sets **Topic:** Set and Its notations **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Describe sets using language (set builder notation).

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 62, 63 and 64

**Teaching & Learning Activities:**

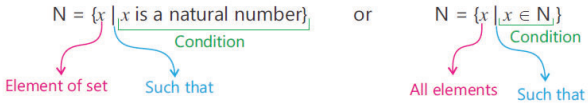
**Opening Activities/Warm-up: (8 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah.

Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work. Ask students about previous day work. Ask students how to represent work in descriptive from? How to represent the sets in tabular form? Take their responses and then write some sets on the board in descriptive and tabular form and then ask them to tell which one is the descriptive and which one is tabular form.

**Main Activities/Concept Building: (22 min)**

Begin the lesson by recalling with students the descriptive and tabular from. Tell them that today we will learn about the representation of set in set builder form. Ask students: Do you how to represent the sets in set builder form. Take their responses and tell them that in set builder form, instead of listing the elements, a common rule, characteristic or formula is written in the shortest possible form that describes the elements of the set. Tell them that a statement or an expression is used to represent all of a set's components in the set builder form. We do not list the components; instead, we use a variable, a vertical line, or a colon to write the representative element along with the general property, common rule, characteristic, formula or condition of the same representative element. Explain the set builder form by writing an example on the board that is: "N = set of natural number" is the descriptive form of the set, whereas N = {1, 2, 3, 4, …} is the tabular form of the set. Tell them that this set can also be written in the set builder form as N = {x|x is a natural number} or N = {x|x∈N}. write the set builder form on the board and tell them that we read it as set N is a set of all elements x, such that x is a natural number". Explain to them the "x" represent the element of the sets and the vertical line "|"which is read as "such that". After this we describe the specific characteristic of the element of the set and at the end we enclosed all the information inside the curly bracket.




explain the representation of set in set builder form by the example given at page 62 and 63 of their textbook. Encourage them to ask question for more clarification.

**Activity:**

Ask students to solve Q1 (a-e) and Q2 (a-d) of "Learning Check 4.1" given on page 64 of textbook. Walk around the class and monitor their work. Guide them if necessary.

**Sum Up: (3 min)**

Sum up the lesson by retelling about how to represent set in set builder form by writing different sets in set builder form.

**Assessment: (5 min)**

Assess students' understanding by asking them to solve "Pause and Try" given on page 63 of textbook.

**Homework: (2 min)**

Solve Q1 (f-i) and Q2 (e-h) of "Learning Check 4.1" given on page 64 of textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 3 **Lesson Plan:** 5

**Unit Name:** Sets **Topic:** Venn diagram **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Describe sets using Venn diagram.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 63-64

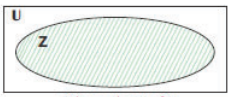
**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 mins)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work. Ask the students about their homework. Write three sets one in tabular, one in descriptive and the third one in set builder form. Call a student to the front of the class and ask him/her to write the first set in descriptive and set builder form take his/her response and instruct the rest of the class to check and correct if needed. Now call another student to the front of the class and ask him/her to write the set in set builder form and tabular form. Repeat the same activity for the third set. Appreciate them for their correct response.

**Main Activities/Concept Building: (25 min)**

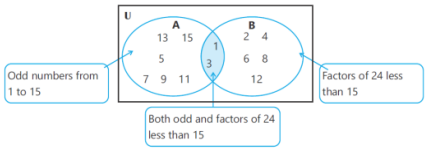
Tell students today we will learn about how to represent sets through Venn diagram. Ask students to open their textbook page 63. Ask students: Do you what is Venn diagram and how we can represent these sets using Venn diagram. Take their responses and tell them that a Venn diagram usually represents the relationship between two or more sets. In Venn diagram circles present the sets and the rectangle shows the universal set. Ask them: Do you know about universal set? Take their answer and tell them that a universal set is the set of all elements of the sets which are under consideration in a particular context. Write the set of integers and set of rational numbers on the board. Tell them that as the set of integers is the subset of set of rational numbers. So rational numbers set is the universal set and the set of integers is represented by a circle inside the rectangle. Draw Venn diagram to represent this and explain to them. For more explanation ask them to open their textbook page 63. In worked example the set a is the set of odd numbers from 1 to 15, the set B is the set of factors of 24 less than 15. Now we show these two sets using Venn diagram. First write the set in tabular form on the board.



Z is a subset of U

A = {1, 3, 5, 7, 9, 11, 13, 15} B = {1, 2, 3, 4, 6, 8, 12}

Now draw a rectangle that shows the universal set. Now observe the set A and set B here the elements 1 and 3 are common to both sets A and B. it means these elements represented in overlapping region. To create the Venn diagram, we draw two overlapping circles or ovals. The left circle represents set A, and the right circle represents set B. Draw Venn diagram and explain each step of drawing Venn diagram to them. Encourage them to ask questions for more explanation.




**Sum Up: (3 min)**

Sum up the lesson by emphasizing by re-telling students how to represent different sets using Venn diagram by demonstrating different examples on the board.

**Assessment: (8 min)**

To assess students ask them solve Q3 (a-b) of "Learning check 4.1" given at page 64 of their textbook.

**Homework: (2 min)**

Solve Q3 (c-d) of "Learning check 4.1" given at page 64 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 3 **Lesson Plan:** 6

**Unit Name:** Sets **Topic:** Power Set **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify power set and method to find the power set using examples.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 65-66

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (7 min )**

Say, "Assalaam u Alaikum" and start with the name of Allah.

Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work.

Ask the students about their homework. Ask students: what is set and the ways to represent the sets. Take their responses and recall with students about the sets and its three ways of representation of set that is tabular, descriptive and set builder form and how to represent the sets using Venn diagram.

**Main Activities/Concept Building: (20 min)**

Begin the lesson by telling students today we will learn about power set. Ask students: Do you know about what is power set. Take their responses and tell them that the set that consists of all the subsets of a set is called the power set of that set. Ask students do you know what is meant by subset of a set. Take their responses and tell them that two sets A and B are given. If all the elements of set A are in set B then set A is called the subset of B. Now write a set A = {a, b} on the board and ask students: can you tell how many subsets can be form of this set. Take their responses and then write all the subsets of set A that is:

{}, {a}, {b}, {a, b}

Tell them that these are the possible subsets of the set A. explain to them when we find the subsets of any set and then enclosed that subsets in a curly brackets then that set is called power set of a set A. for more explanation solve the worked example 2 given at page 65 of their textbook where we find the subsets of the set of B and explain the method to find the subsets of a set.

**Activity:**

Ask students to solve Q1 (a, b, c) of Learning check 4.2 given on page 66 of textbook. Walk around the class and monitor their work. Guide them if necessary.

**Sum Up: (3 min)**

Sum up the lesson by retelling about what is the power set and method to find the power set. Also explain the "Note to Remember" given at page 65.

**Assessment: (8 min)**

Assess students' understanding by asking them to solve Q1 (d, e) of Learning check 4.2 given on page 66 of textbook. Walk around and check their work and discuss with them about their common mistakes.

**Homework: (2 min)**

Solve Q1 (f-h) of "Learning Check 4.2" given on page 66 of textbook

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 3 **Lesson Plan:** 7

**Unit Name:** Sets **Topic:** Power Law **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Find the power set (P) of set A where A has up to four elements.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 65-66

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 mins)**

Say, "Assalaam u Alaikum" and start with the name of Allah.

Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work. Ask the students about their homework. As students explain the concept of subset and power set? Ask students to tell what is the method of finding power set of a set? Take their responses and recall with them that power set consists of all the subsets of a set.

**Main Activities/Concept Building: (25 min)**

Have students open textbook at page 65. Tell them that today we will learn to find the power set of a set A where A has up to 4 elements. Write the set Y = {1, 2} given in the worked example 1. Now tell students as power set is the set of all possible subsets of a given set. Emphasize that the power set includes the empty set and the set itself as subsets. Ask students to brainstorm and list all possible subsets of set Y. Discuss their responses and highlight that the power set of A is the collection of all these subsets. Explain the step-by-step process to find the power set of a set with up to four elements: Start with an empty set as the first subset then list all single-element subsets that is {1} and {2} at the end list all two-element subsets that is {1, 2}.

Power set of Y = P (Y) = {φ, {0}, {1}, {0, 1}}

Now solve the worked example 3 given on page 65. Tell students when we find the power set of a set that has three elements first write the empty set then list all single-element subsets then list all two-element subsets and at the end list all three-element subsets of a set. Now solve the worked example 3 on the board step by step and explain each step to find the power set of set A = {a, e, i}

P (A) = { } {a}, {e}, {i}, {a, e}, {a, i}, {e, i}, {a, e, i}}

For more explanation of the power set write any set of 4 elements. And first list all the subsets of that set and then enclosed those subsets in curly brackets to show the power set of that set. Encourage students to ask questions where they found any difficulty.

**Activity:**

Ask students to open their textbook page 66. Write the Q2 part a on the board. Call a student to the front of the class and ask him/her to find the power set of the given set. Ask the rest of the class to check and correct if required. Repeat this activity to some other students of the class to solve part b, c and d of Q2. After this ask students to copy those parts of Q2 in their notebooks.

**Sum Up: (2 min)**

Sum up the lesson by retelling about power set of any set and how to find the power set. Also explain Note to remember given at page 65 of their textbook.

**Assessment: (6 min)**

Assess students' understanding by asking them to solve "Pause and Try" given at page 65 of their textbook. Walk around and check their work and guide them where required. Discuss with them about their common mistakes.

**Homework: (2 min)**

Solve Q2 (e-h) of "learning check 4.2" given at textbook page 66.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 1

**Unit Name:** Sets **Topic:** Properties and Laws of set Operations **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Describe operations on sets and verify commutative law with respect to union and intersection.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 66, 67, 71 and 72

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students what they have learnt yesterday and about their homework. Recall with students about power set. Tell students today we will learn about commutative law with respective to union and intersection.

**Main Activities/Concept Building:** **(25 mins)**

Begin the lesson by explaining to students that today we will be learning about an important law of with respect to union and intersection that is commutative law. Ask students: Do you know about this law? Take their responses and write the following symbols on the board: $\cup$ (union) and $\cap$ (intersection). Explain that these symbols represent two common operations performed on sets: union and intersection. The union of two sets A and B, denoted as $A \cup B$, is the set that contains all the elements that are in A or in B or in both. Intersection ($\cap$): The intersection of two sets A and B, denoted as $A \cap B$, is the set that contains all the elements that are common to both A and B. Ask students to open their textbook page 66. Tell students like addition and multiplication of numbers as addition and multiplication of two numbers remains the same regardless of order of the numbers. Similarly for any two sets A and B the union and intersection of A and B are the same, regardless of the order in which they are combined. Write on the board that if A and B are two sets then $A \cup B = B \cup A$ is the commutative property under union and $A \cap B = B \cap A$ is the commutative property under intersection. For more explanation write the worked example given at textbook page 66 on the board where two sets $S = \{1, 3, 5, 7, 9\}$ and $T = \{5, 6, 7, 8, 9\}$ and we have to prove that $S \cup T = T \cup S$. Now first find $S \cup T$ and then we find $T \cup S$.

LHS = $S \cup T = \{1, 3, 5, 7, 9\} \cup \{5, 6, 7, 8, 9\}$ RHS = $T \cup S = \{5, 6, 7, 8, 9\} \cup \{1, 3, 5, 7, 9\}$

$S \cup T = \{1, 3, 5, 6, 7, 8, 9,\}$ .....(i) $T \cup S = \{1, 3, 5, 6, 7, 8, 9,\}$ .....(ii)

Now ask students to observe the set (i) and set (ii) both are same. So we can say that $S \cup T = T \cup S$. Encourage students to ask questions for more explanation and clarification. For more explanation solve the worked example given at page 67 for commutative law with respect to intersection. Solve step by step and explain each step to them.

**Activity:**

Instruct students to open their textbook page 71. Ask them to solve Q1 (a, b) and Q2 (a, b) of “Learning Check 4.3”. Walk around and check their work and guide them if required.

**Sum Up:** **(3 min)**

Sum up the lesson by re-telling students about commutative law under union and intersection. Explain that this is the important law in mathematics that help us solve problems quickly and accurately.

**Assessment:** **(5 min)**

To assess students ask them to solve “pause and Try” given at textbook pages 67 in their notebooks. Walk around and check their work.

**Homework:** **(2 min)**

Solve Q3(a, b, c) of “Learning Check 4.3” given at page 72 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 2

**Unit Name:** Sets **Topic:** Properties and Laws of set Operations **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Verify associative, law with respect to union and intersection.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 67, 68, 71 and 72

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 mins)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students what they have learnt yesterday and about their homework. Recall with students about commutative law of two sets with respect to union and intersection.

**Main Activities/Concept Building: (25 mins)**

Begin the lesson by explaining to students that today we will be learning about an important law of with respect to union and intersection that is associative law. Ask students: Do you know about this law? Take their responses and write the following symbols on the board: $\cup$ (union) and $\cap$ (intersection). Explain that these symbols represent two common operations performed on sets: union and intersection. The union of two sets A and B, denoted as $A \cup B$, is the set that contains all the elements that are in A or in B or in both. Intersection ($\cap$): The intersection of two sets A and B, denoted as $A \cap B$, is the set that contains all the elements that are common to both A and B. Ask students to open their textbook page 67. Tell students like addition and multiplication of numbers as addition and multiplication of three numbers remains the same regardless of how the numbers are grouped. Similarly for any three sets A, B and C the union and intersection of A, B and C are the same, regardless of how the sets are grouped. Write on the board that if A, b and C are three sets then $A \cup (B \cup C) = (A \cup B) \cup C$ is the associative property under union and $A \cap (B \cap C) = (A \cap B) \cap C$ is the associative property under intersection. For more explanation write the worked example given at textbook page 67 on the board where three sets that are: sets A = {2, 3, 5, 7, 9}, B = {1, 2, 3, 4, 5} and C = {2, 4, 6, 8} we have to prove that $A \cup (B \cup C) = (A \cup B) \cup C$.

Now first find $A \cup (B \cup C)$ and then we find $(A \cup B) \cup C$.

LHS = $A \cup (B \cup C)$

$B \cup C = \{1, 2, 3, 4, 5\} \cup \{2, 4, 6, 8\} = \{1, 2, 3, 4, 5, 6, 8\}$

$A \cup (B \cup C) = \{2, 3, 5, 7, 9\} \cup \{1, 2, 3, 4, 5, 6, 8\} = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$.....(I)

RHS = $(A \cup B) \cup C$

$A \cup B = \{2, 3, 5, 7, 9\} \cup \{1, 2, 3, 4, 5\} = \{1, 2, 3, 4, 5, 7, 9\}$

$(A \cup B) \cup C = \{1, 2, 3, 4, 5, 7, 9\} \cup \{2, 4, 6, 8\} = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$.....(ii)

Now ask students to observe the set (i) and set (ii) both are same.

So we can say that $A \cup (B \cup C) = (A \cup B) \cup C$.

Encourage students to ask questions for more explanation and clarification. For more explanation solve the worked example given at page 68 for associative law with respect to intersection. Solve step by step and explain each step to them.

**Activity:**

Instruct students to open their textbook page 71. Ask them to solve Q1 (c, d) and Q2 (c, d) of “Learning Check 4.3”. Walk around and check their work and guide them if required.

**Sum Up: (3 min)**

Sum up the lesson by re-telling students about associative law under union and intersection. Explain that this is the important law in mathematics that helps us solve problems quickly and accurately.

**Assessment: (5 min)**

To assess students ask them to solve “pause and Try” given at textbook pages 67 in their notebooks. Walk around and check their work.

**Homework: (2 min)**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

Solve Q3 (d) of “Learning Check 4.3” given at page 72 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 3

**Unit Name:** Sets **Topic:** Properties and Laws of set Operations **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Verify distributive laws with respect to union and intersection.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 68, 69, 71 and 72

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 mins)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students what they have learnt yesterday and about their homework. Recall with students about associative law of three sets with respect to union and intersection.

**Main Activities/Concept Building: (25 mins)**

Begin the lesson by explaining to students that today we will be learning about an important law of with respect to union and intersection that is distributive law. Ask students: Do you know about this law? Take their responses Ask students to open their textbook page 68. Tell students distributive law of multiplication under addition and subtraction, stating that when multiplying an integer by a group of integers added or subtracted together, it is the same as doing each multiplication separately and then adding or subtracting their products. Now for any three sets A, B and C the union of a set with group intersection of two sets is the same as performing union separately and then finding their intersection. Similarly for any three sets A, B and C the intersection of a set with union of two sets is the same as performing intersection separately and then finding their union. Write on the board that if A, B and C are three sets then

$A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$ is the distributive property of union of sets over intersection and

$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ is the distributive property of intersection over union. For more explanation write the worked example given at textbook page 68 on the board where three sets that are:

$X = \{0, 3, 6, 9, 12, 15\}$, $Y = \{-5, -3, -1, 0, 1, 3, 5\}$ and $Z = \{2, 4, 6, \ldots, 16\}$ we have to prove that $X \cup (Y \cap Z) = (X \cup Y) \cap (X \cup Z)$.

Now first find $X \cup (Y \cap Z)$ and then we find $(X \cup Y) \cap (X \cup Z)$..

LHS = $X \cup (Y \cap Z)$

$Y \cap Z = \{-5, -3, -1, 0, 1, 3, 5\} \cap \{2, 4, 6, \ldots, 16\} = \{\ \}$

So, $X \cup (Y \cap Z) = \{0, 3, 6, 9, 12, 15\} \cup \{\ \} = \{0, 3, 6, 9, 12, 15\}$.....(i)

$X \cup Y = \{0, 3, 6, 9, 12, 15\} \cup \{-5, -3, -1, 0, 1, 3, 5\} = \{-5, -3, -1, 0, 1, 3, 5, 6, 9, 12, 15\}$

$X \cup Z = \{0, 3, 6, 9, 12, 15\} \cup \{2, 4, 6, \ldots, 16\} = \{0, 2, 3, 4, 6, 8, 9, 10, 12, 14, 15, 16\}$

$(X \cup Y) \cap (X \cup Z) = \{-5, -3, -1, 0, 1, 3, 5, 6, 9, 12, 15\} \cap \{0, 2, 3, 4, 6, 8, 9, 10, 12, 14, 15, 16\}$

$= \{0, 3, 6, 9, 12, 15\}$.....(ii)

Now ask students to observe the set (i) and set (ii) both are same.

So we can say that $X \cup (Y \cap Z) = (X \cup Y) \cap (X \cup Z)$. Encourage students to ask questions for more explanation and clarification. For more explanation solve the worked example given at page 69 for distributive law of intersection over union. Solve step by step and explain each step to them.

**Activity:**

Instruct students to open their textbook page 71. Ask them to solve Q1 (e, f) and Q2 (e) of “Learning Check 4.3”. Walk around and check their work and guide them if required.

**Sum Up: (3 min)**

Sum up the lesson by re-telling students about distributive law. Explain that this is the important law in mathematics that helps us solve problems quickly and accurately. Also explain “Note to remember” given at page 69.

**Assessment: (5 min)**

To assess students ask them to solve “pause and Try” given at textbook pages 69 in their notebooks. Walk around and check their work.

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Homework:** **(2 min)**

Solve Q2(f) and Q3 (e) of “Learning Check 4.3” given at page 71 and 72 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 4

**Unit Name:** Sets **Topic:** De Morgan's law **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Verify De Morgan's law of Union and represent through Venn diagram.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 70 and 72

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students what they have learnt yesterday and about their homework. Recall with students about distributive law of three sets with respect to union over intersection and intersection over union.

**Main Activities/Concept Building:** **(25 mins)**

Begin the lesson by explaining to students that today we will be learning about another very important law of with respect to union that is De Morgan's law. Ask students: Do you know about this law? Take their responses and ask students what is meant by union of two sets? What is meant by intersection of two sets? What is meant by complement of a set? What is meant by universal set? Take their responses and appreciate them for their correct answer. Ask students to open their textbook page 70. Tell students to simplify the sets, we have a law that is called De Morgan's law. It has two parts: the first part is called De Morgan's law of union, and the second part is called De Morgan's law of intersection. Today we will learn about the first part that is De Morgan's law under union. Tell them that if A and B are two sets then $(A \cup B)^c = A^c \cap B^c$. this shows that when we find the complement of union of two sets A and B then it is equal to the intersection of complements of A and complement of B.

For more explanation write the worked example given at textbook page 70 on the board where three sets that are:

**U** = {1, 2, 3, …, 12} A {7, 8, 9, 10, 11, 12} B = {3, 5, 7, 9, 11}

Now we have to find $(A \cup B)^c = A^c \cap B^c$.

**LHS** = $(A \cup B)c$ = **U** - $(A \cup B)$

= {1, 2, 3, …, 12} – [{7, 8, 9, 10, 11, 12}∪{3, 5, 7, 9, 11}

= {1, 2, 3, …, 12} – {3, 5, 7, 8, 9, 10, 11, 12}

= {1, 2, 4, 6, }

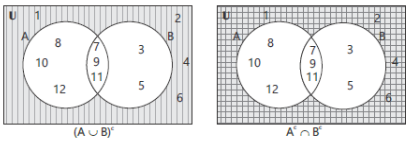
**RHS** = $A^c \cap B^c$ = (**U** - A) ∩ (**U** - B)

= [{1, 2, 3, …, 12} - {7, 8, 9, 10, 11, 12}] ∩ [{1, 2, 3, …, 12} - {3, 5, 7, 9, 11}]

= {1, 2, 3, 4, 5, 6}∩{1, 2, 4, 6, 8, 10, 12}

= {1, 2, 4, 6}

So we can say that $(A \cup B)^c = A^c \cap B^c$. Now tell students how to represent the De Morgan's Law under union using Venn diagram. Draw Venn diagram on the board and explain step to draw Venn diagram. Encourage students to ask questions for more explanation and clarification.




**Activity:**

Instruct students to open their textbook page 72. Ask them to solve Q4 (a-c) for De Morgan's Law under union of "Learning Check 4.3". Walk around and check their work and guide them if required.

**Sum Up:** **(3min)**

Sum up the lecture by retelling the steps of finding De Morgan's Law under union.

**Assessment:** **(5min)**

To assess students' learning, ask them to solve Q4(d) for De Morgan's Law under union of "Learning Check 4.3".

**Homework:** **(2 min)**

Solve Q4(e, f) for De Morgan's Law under union of "Learning Check 4.3".

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 5

**Unit Name:** Sets **Topic:** De Morgan's Law **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Verify De Morgan's law of intersection and represent through Venn diagram.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 71 and 72

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students what they have learnt yesterday and about their homework. Recall with students about De Morgan's law of three sets with respect to intersection.

**Main Activities/Concept Building:** **(25 mins)**

Begin the lesson by explaining to students that today we will be learning about another very important law of with respect to union that is De Morgan's law. Ask students: Do you know about this law? Take their responses and ask students what is meant by union of two sets? What is meant by intersection of two sets? What is meant by complement of a set? What is meant by universal set? Take their responses and appreciate them for their correct answer. Ask students to open their textbook page 71. Tell students to simplify the sets, we have a law that is called De Morgan's law. It has two parts: the first part is called De Morgan's law of union, and the second part is called De Morgan's law of intersection. Today we will learn about the second part that is De Morgan's law under intersection Tell them that if A and B are two sets then $(A \cap B)^c = A^c \cup B^c$. this shows that when we find the complement of intersection of two sets A and B then it is equal to the union of complements of A and complement of B.

For more explanation write the worked example given at textbook page 71 on the board where three sets that are:

**U** = {1, 2, 3, …, 12} A {7, 8, 9, 10, 11, 12} B = {3, 5, 7, 9, 11}

Now we have to find $(A \cap B)^c = A^c \cup B^c$.

LHS = $(A \cap B)^c$ = U – (A∩B)

= {1, 2, 3, …, 12} – [{7, 8, 9, 10, 11, 12}∩{3, 5, 7, 9, 11}

= {1, 2, 3, …, 12} – {7, 9, 11}

= {1, 2, 3, 4, 5, 6, 8, 10, 12}

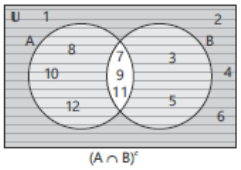
RHS = Ac∪Bc = (U-A)∪(u-B)

= [{ {1, 2, 3, …, 12} - {7, 8, 9, 10, 11, 12}] ∪ [{1, 2, 3, …, 12} - {3, 5, 7, 9, 11}]

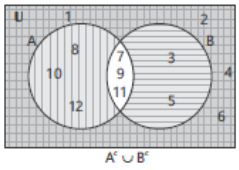
= { {1, 2, 3, …, 6} - }∪{1, 2, 4, 6, 8, 10, 12}

= {1, 2,3, 4, 5, 6, 8, 10, 12}

So we can say that $(A \cap B)^c = A^c \cup B^c$. Now tell students how to represent the De Morgan's Law under intersection using Venn diagram. Draw Venn diagram on the board and explain step to draw Venn diagram. Encourage students to ask questions for more explanation and clarification.



$(A \cap B)^c$



$A^c \cup B^c$

**Activity:**

Instruct students to open their textbook page 72. Ask them to solve Q4 (a-c) for De Morgan's Law under intersection of "Learning Check 4.3". Walk around and check their work and guide them if required.

**Sum Up:** **(3min)**

Sum up the lecture by retelling the steps of finding De Morgan's Law under intersection.

**Assessment:** **(5min)**

To assess students' learning, ask them to solve Q4 (d) for De Morgan's Law under intersection of "Learning Check 4.3".

**Homework:** **(2 min)**

Solve Q4 (e, f) for De Morgan's Law under intersection of "Learning Check 4.3".

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Teacher's Self-Evaluation:**
**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐
**Reason/Comments:**

_____
_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 6

**Unit Name:** Sets **Topic:** Real-life Situation involving sets **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify the application of sets on real-life word problems.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 72, index card or paper slips

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask students about their previous day homework. Ask students what is the De Morgan’s law under union and intersection. Take their responses and then recall with them about the De Morgan’s law.

**Main Activities/Concept Building: (25 min)**

Tell students today we will learn to identify the application of sets in our real-life. Begin the lesson by asking students if they are familiar with any real-life situations where sets can be applied. Discuss examples as a class, such as categorizing types of pets or grouping students based on their hobbies or interests. Emphasize that sets can be useful for organizing and classifying objects or people based on shared characteristics. Write the following terms on the board: union, intersection, and complement. Review the definitions of these terms and briefly explain how they relate to real-life situations. Provide an example, such as: "Suppose you have two sets: Set A represents students who play soccer, and Set B represents students who play basketball. If we want to find the students who play both soccer and basketball, which operation should we use?" Allow students to respond and discuss the concept of intersection. Similarly discuss with them different real life situation where we use union and complement. Encourage students to ask questions for more explanation. Ask students to open their textbook page 72 and learn more about it.

**Activity:**

Divide the class into small groups or pairs. Instruct each group to come up with a real-life situation that involves sets and can be turned into a word problem. For example, they can create a situation involving different types of food preferences or categorizing students based on favourite subjects. Each group presents their situation to the class, explaining the sets involved and the problem they want to solve. Once all situations are presented, distribute index cards or small slips of paper to each student. Instruct students to solve the word problems presented by other groups, using the concepts of sets and set operations. Encourage students to discuss and collaborate within their groups to find solutions. Circulate around the classroom to provide assistance and guidance as needed. After the allocated time, allow groups to share their solutions and strategies with the class. Lead a class discussion about the application of sets in the real-life word problems presented by the groups. Ask students to share their findings and explain how they applied set operations to solve the problems.

**Sum Up: (3min)**

Summarize the key points of the lesson, emphasizing the application of sets in real-life word problems and discuss with them the importance of understanding and using set operations to solve problems in various contexts.

**Assessment: (7 min)**

To check students’ learning, ask them to share different real-life situation where we use sets and operation of sets.

**Homework: (2 min)**

Revise classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 7

**Unit Name:** Sets **Topic:** Real-life Situation involving sets **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Apply sets in real-life word problems.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 72 and 73

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaamu Alaikum" and start with the name of Allah.

Ask students: How are you? Encourage them to say, "Alhamdulillah".

Begin the lesson by engaging students in a discussion about sets. Ask them to share examples of sets they encounter in their daily lives (e.g., types of pets, favorite sports, etc.). Write a few examples on the board and ask students to identify the elements in each set. Discuss the concepts of elements, subsets, and universal sets based on the examples provided.

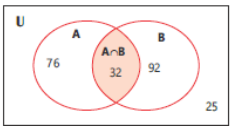
**Main Activities/Concept Building:** **(25 mins)**

Tell students today we will learn about application of sets in our daily life. Ask students: do you know the problem of real-life where we use sets and their operation. Take their responses and tell them that we often use sets to categorize and organize objects, information, or people. For instance, when organizing our belongings, we might create sets for different types of clothing (shirts, pants, shoes) or different categories of books (storybooks, Islamic books, history books). This helps us keep things organized and easily locate what we need. Tell them that they can use set to categorize sports and hobbies. They can create sets for different types of sports (soccer, basketball, swimming) or hobbies (reading, painting, and playing an instrument). By using set operations, they can identify sports or hobbies that they are interested in or find common activities among friends. For more explanation ask students to open their textbook page 73 and read the statement of the worked example where 225 people who bought various ice cream flavours. Observe the table where people who bought only vanilla is 76 and if we name it set A and name set B to the people who bought only strawberry. The people who bought both vanilla and strawberry is the intersection of A and B that is 32.

| People who bought only vanilla | People who bought only strawberry | People who bought both |
|---|---|---|
| 76 | 92 | 32 |

To draw a Venn diagram that shows these sets we have to subtract the sum of 76, 92 and 332 from 225 that is:

76 + 92 + 32 = 200 225 -200 = 25




Now Venn diagram to show this and explain each step to students. Encourage students to ask questions for more explanations.

**Activity:**

Have students work in pairs. Ask them to solve Q1 of "Learning check 4.4" given on page 73 of textbook. Walk around the class, monitor their working and guide them where required.

**Sum Up:** **(3 min)**

Sum up the lecture by retelling about sets and the situation of real-life where sets are used.

**Assessment:** **(5min)**

To assess students' learning, ask them solve Q2 of "Learning check 4.4" given on page 73 of textbook. Walk around the class, monitor their working and guide them where required.

**Homework:** **(2 min)**

Solve Q3 and Q4 of "Learning check 4.4" given on page 73 of textbook

**Teacher's Self-Evaluation:** **Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 5 **Lesson Plan:** 1

**Unit Name:** Sets **Topic:** Sum Up and Unit Check **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 4 by solving Q1-6 of Unit Check Exercise.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 73-74

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Tell students that they are going to revise all the concepts of the Unit “Sets”.
Ask them the different questions that are related to the unit

**Main Activities/Concept Building: (30 min)**

**Activity:**

Have students open page 74 of their textbooks. Ask them to solve Q1 to Q4 of “Unit check 4” of their textbooks. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Sum Up: (3 min)**

Sum up the lesson by repeating the important points of unit using sum up given at page 73.

**Assessment: (0 min)**

N/A

**Homework: (2 min)**

Solve Q5-6 of Unit check 4 given at page 74 of their textbooks.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 5 **Lesson Plan:**2

**Unit Name:** Sets **Topic:** Sum and Unit check **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 4 by solving Q7-9 of Unit Check Exercise and by completing "work with math" activity.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 75

**Teaching & Learning Activities:**

## Opening Activities/Warm-up: (5 min)

Say, "Assalaamu Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Tell students that they are going to revise all the concepts of the Unit "Sets".
Ask them the different questions that are related to the unit

## Main Activities/Concept Building: (30 min)

**Activity:**

Have students open page 75 of their textbooks. Ask them to solve Q7-8 of "Unit check 4" of their textbooks. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Activity 2:**

**Tell students that now we are going to do an activity of 'work with math' on page 75.**

- Make small groups of students.
- Put flash cards of sets in one basket and operations on sets in the second basket.
- Instruct each group to select three cards from the set card basket and two cards from operations on sets.
- Instruct them to apply the operations on that sets and then show the operations through Venn diagrams.
- Then instruct them to share their findings with each other.
- The group with accurate work in a short time is the winner.

**Sum Up:** **(3 min)**

Sum up the lesson by repeating the important points of unit using sum up.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Solve Q9 of "Unit check 4" given at page 75 of their textbooks.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 5 **Lesson Plan: 3**

**Unit Name:** Financial Arithmetic **Topic:** Revision **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (3 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Financial Arithmetic”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building: (30 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up: (5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment: (0 min)**

N/A

**Homework: (2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Worksheet**

**Name: _____** **Date: _____**

1. **A Baker baked 76 pastries in 30 minutes. How many pastries he baked in 45 minutes?**

2. **Three men cementing the wall in 3 hours. How many hours needed to cement the same wall if there are 5 men?**

3. **Draw graph for the following and identify the quantities are in direct proportion or inverse proportion.**

| x | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| y | -1 | 2 | 5 | 8 | 11 |

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 5 **Lesson Plan: 4**

**Unit Name:** Financial Arithmetic **Topic:** Unit check **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit "Financial Arithmetic".

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(3 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah.

Ask students: How are you? Encourage them to say, "Alhamdulillah".

Ask them a few questions related to the concept of unit "Financial Arithmetic".

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Worksheet**

**Name: _____** **Date: _____**

1. **6 machines work for 8 days and produce 1200 shirts. if the 2 machines are out of order . how many shirts were made in 16 days?**

2. **Find the marked price of the table if the selling price of table is Rs 15000 and percentage discount is 12%.**

3. **Ali wants to invest Rs 35000. How long would he have to be invested at a markup rate of 10% per year to gain Rs 6500?**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 5 **Lesson Plan:** 5

**Unit Name: Financial Arithmetic** **Topic:** Revision **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Financial Arithmetic”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(3 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Ask them a few questions related to the concept of unit “Financial Arithmetic”.
Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**
**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐
**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Worksheet**

**Name: _____** **Date: _____**

**Hania purchased a car in Rs 3,345,000 and insured it for one year at the rate of 10 %. Find the annual premium.**

**Ahmad died by leaving a property of Rs 20,000,000. He left his widow, two daughters and three sons. Find the share of each in the property.**

**Convert 760 Pakistani rupees to British pound sterling and United states Dollar.**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 5 **Lesson Plan:** 6

**Unit Name:** Sets **Topic:** Revision **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Sets”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(3 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Sets”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Worksheet**

**Name: _____** **Date: _____**

1. **Write the following sets in set builder form.**
   a) **The set of composite numbers greater than 5 but less than 20.**

   b) **{9, 18, 27, 36, 45, 54}**

2. **Write the given set in descriptive form.**
   a) **$\{x|x\in N\wedge 24\leq x\leq 50\}$**

   b) **{1, 3, 5, 7, 9, …21}**

3. **Represent the sets using Venn diagram.**

   **A = set of multiples of 3** **B = Set of multiples of 6**

4. **Write the power sets of the given sets.**

a) **X = {4, 5, 6, 7}**

b) **H = set of prime numbers less than 13**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term:** 1 **Periodic Unit: 2** **Week:** 5 **Lesson Plan:** 7

**Unit Name:** Sets **Topic:** Revision **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Sets”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(3 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Sets”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Worksheet**

**Name: _____** **Date: _____**

1. **If A = {2, 4}, B = {1, 3} and C = {1, 2, 3, 4, 5}, then prove the following.**

   a) **$A \cup (B \cup C) = (A \cup B) \cup C$**

   b) **$A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$**

2. **Statement and Verify De Morgan's law for the given sets.**

   **U = set of whole numbers** **A = set of multiples of 4 less than 100**

   **B = set of even numbers less than 50**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 1 **Lesson Plan:** 1

**Unit Name:** Sequence and Algebra **Topic:** Arithmetic and Geometric Sequence **Date**:_____

## Objective(s):

**At the end of this period, the students will be able to:**

Differentiate between an arithmetic sequence and a geometric sequence.

## Resource Material:

Chalk/Marker, White/Blackboard, Textbook page 76, 77 and 80

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (8 mins)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work. Have students open textbook at page 76. Quickly recall the concepts related to questions given in rapid recall. Then ask them to solve those questions. Read the opening page question and tell them that we will be able to solve it after learning about the concepts of the unit.

(***Note for teachers:*** *The sections "Think out of the box", "Talk over and write" and "Technology corner" are supplementary exercises. These can also be given to students who finish their work quickly or are fast learners.)*

**Main Activities/Concept Building: (22 mins)**

Before the main concept, tell them briefly about the unit outline and its real life relevance. Begin the lesson by asking students if they know what a sequence is? Allow some students responses. Explain to them a sequence as an ordered list of numbers where each term follows a specific pattern or rule. Tell them that in this lesson, they will explore two types of sequences arithmetic and geometric. Ask them if they have heard of arithmetic and geometric sequences before? Tell them that an arithmetic sequence is a sequence in which the difference between consecutive terms remains constant. Instruct students to open their textbook page 77 and read the statement of the worked example. Ask them what is given and what we have to find. Take their responses and tell them that number of pages typed by Mohsin on first, second and third day is given and we have to find what type of sequence followed by the Mohsin. First write the sequence of number of pages typed. 4, 8, 12, …

Instruct students to observe the given sequence. Tell them that the terms of the sequence are obtained by adding 4 to the previous term, so the difference between the two consecutive terms is 4(8 – 4 = 4). It is an arithmetic sequence. Explain the arithmetic sequence by giving different examples to them.

Write the worked example given at page 77 on the board that is: 3, 6, 12, 24, …

Instruct students to observe the sequence where each term is obtained by multiplying previous term by 2. Tell students when we get a sequence of numbers in which each term is obtained by multiplying or dividing the preceding term by a fixed number (known as the common ratio) is called a geometric sequence. Explain the geometric sequence by giving different examples to students. Tell them that the difference between the arithmetic and geometric sequence by giving different examples.

**Sum Up: (3min)**

Sum up the lesson by retelling students about arithmetic and geometric sequence and difference between these two terms.

**Assessment: (5 min)**

Assess students' understanding by asking them to solve 'pause and try' given on page 77 of their textbook.

**Homework: (2 min)**

Solve Q1 of "Learning check 5.1" given at page 80 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 1 **Lesson Plan:** 2

**Unit Name:** Sequence and Algebra **Topic:** Finding Terms of the Arithmetic sequence **Date**: ___

## Objective(s):

**At the end of this period, the students will be able to:**

Find terms of an arithmetic sequence using term-to-term rule.

## Resource Material:

Chalk/Marker, White/Blackboard, Textbook page 78 and 80

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Ask students about their previous day homework. Begin the lesson by asking students what is meant by arithmetic and geometric sequence? Take their responses and call a student to the front of the class and ask him/her to write a geometric sequence and an arithmetic sequence on the board. Instruct the rest of the class to check whether he/she correct or not. Appreciate them for their active participation.

**Main Activities/Concept Building: (25 min)**

Tell students today we will learn about find the terms of the arithmetic sequence. Recall with students the arithmetic sequence. Tell them that a sequence in which the difference between two consecutive terms remains constant is called arithmetic sequence. Tell students there are two methods to find the terms of the arithmetic sequence one is called term-to-term rule and second one is called position-to-term rule. Today we will learn to find the term of the arithmetic sequence by using term-to-term rule. Recall with students what is term-to-term rule? The term-to-term rule of a pattern describes how to get the next term in that specific pattern. Write an example of an arithmetic sequence on the board: 2, 5, 8, 11, … given at page 78 of their textbook. Instruct students to observe the given sequence. First we find the common difference between the consecutive terms. $5 - 2 = 3$, $8 - 5 = 3$, $11 - 8 = 3$
The difference between the two terms is 3, so the next terms of the sequence can be obtained by adding 3 to each previous term. The next three terms of the sequence are: $11 + 3 = 14$, $14 + 3 = 17$, $17 + 3 = 20$.
So the arithmetic sequence is: 2, 5, 8, 11, 14, 17, 20, … Encourage students to ask questions if they have any confusion. For more clarification solve different examples for finding terms of the arithmetic sequence by using term-to-term rule and explain each step to them.

**Activity:**

Divide the students into small groups. Assign each group a unique arithmetic sequence, keeping the common difference reasonable. Instruct the groups to observe the arithmetic sequence and the process of finding the terms using the term-to-term rule. Encourage them to find the next terms. Have each group present their work to the class. After each presentation, the other students can identify the common difference and discuss the steps taken to find the terms.

**Sum Up: (3min)**

Sum up the lesson by retelling students about the arithmetic sequence and the term –to-term rule for finding the missing terms of the arithmetic sequence.

**Assessment: (5 min)**

Assess students’ understanding by asking them to solve Q2 (a, b, c) of “Learning Check 5.1” given at page 80 of their textbook.

**Homework: (2 min)**

Solve Q2 (d, e, f) of “Learning Check 5.1” given at page 80 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 1 **Lesson Plan:** 3

**Unit Name:** Sequence and Algebra **Topic:** Finding Terms of the Arithmetic sequence **Date**: ___

## Objective(s):

**At the end of this period, the students will be able to:**

Find terms of an arithmetic sequence using position to term rule.

## Resource Material:

Chalk/Marker, White/Blackboard, Textbook page 78 and 80

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(8 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask students about their previous day homework. Begin the lesson by asking students: What is meant by arithmetic sequence? How we can find the missing terms of the arithmetic sequence by term-to-term rule? Take their responses and then call a student to the front of the class and ask him/her to write an arithmetic sequence with missing terms. Take his/her responses and appreciate for his/her good work. Now call another student to the front of the class and ask him/her to find the missing terms of the sequence by using term-to-term rule. Ask the rest of the class to check and correct if needed. Repeat this activity to some other students of the class.

**Main Activities/Concept Building:** **(22 min)**

Tell students today we will learn about finding the terms of the arithmetic sequence by using position-to-term rule. Recall with students what is the position to term rule? The position-to-term rule is a mathematical rule that allows us to find any term of a sequence based on its position. The position to term rule is basically the relationship between position of the terms of the sequence and terms of the sequence. Ask students to open their textbook page 78. Instruct them to read the statement of the worked example 2 and tell what is given and what we have to find. Take their responses and tell them that an arithmetic sequence is given and we have to find the 25th of the given sequence by using position-to-term rule. Write the sequence on the board that is: 2, 4, 6, 8, 10, …

Instruct students to observe the sequence, each term can be found by multiplying 2 to the position of the term. By multiplying 2 to the first position we get 2 and by multiplying 2 to the second positon we get 4 and in the same way if we want to find the 25th term of the sequence then we multiply 25 by 2 that $25 \times 2 = 50$. So, the 25th term of the given sequence is 50. Instructstudents to ask questions if they have any confusion. For more clarification solve some more examples on the board and explain it to them.

| Position | 1st | 2nd | 3rd | 4th | 5th |
|---|---|---|---|---|---|
| Terms | 2 | 4 | 6 | 8 | 10 |
| Term rule | $1 \times 2$ | $2 \times 2$ | $2 \times 3$ | $2 \times 4$ | $2 \times 5$ |

**Activity:**

Divide the class into small groups and assign each group one of the example sequences. In their groups, students should take turns finding specific terms using the position-to-term rule. Encourage them to use the formula to calculate at least three different terms for each sequence. Circulate around the classroom to assist and support students as they work through the problems. Bring the class back together and review the concept of arithmetic sequences and the position-to-term rule. Ask students to share their findings and discuss any challenges they faced while using the position-to-term rule.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students about the arithmetic sequence and the importance of using position-to-term rule for finding the given terms of the arithmetic sequence.

**Assessment:** **(5 min)**

Assess students’ understanding by asking them to solve Q3 (a, b, c) of “Learning Check 5.1” given at page 80 of their textbook.

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Homework:** **(2 min)**

Solve Q3 (d, e, f) of “Learning Check 5.1” given at page 80 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 1 **Lesson Plan:** 4

**Unit Name:** Sequence and Algebra **Topic:** General Term of an Arithmetic sequence **Date**: ___

## Objective(s):

**At the end of this period, the students will be able to:**

Construct the formula for the general term (nth term) of an arithmetic sequence.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 79 and 81

## Teaching & Learning Activities:

**Opening Activities/Warm-up: (5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work. Begin the lesson by asking students about their homework. Ask students: What is arithmetic sequence? How we can find the terms of the sequence by using term-to-term rule and position-to-term rule? Take their responses and then write few examples of arithmetic sequences and instruct students to find the common difference between consecutive terms. Walk around and check their work and guide them where required. Appreciate them for their good response.

**Main Activities/Concept Building: (20 min)**

Have students open their textbook page 79. Recall with students what is arithmetic sequence? A sequence of numbers in which the difference between any two consecutive numbers is the same is called arithmetic sequence. Write the sequence 1, 3, 5, 7, 9, … on the board and tell students this is the sequence of odd numbers. Ask students what is the common difference between two consecutive terms of the given sequence. Take their responses that must be 2. Tell students as the first term of the sequence is 1 and the common difference is 2 so we can write the terms of the given sequence as: 1 , 1 + 2, 3 + 2, 5 + 2, 7 + 2, …
Or we can write it as: 1, 1 + 1(2), 1 + 2(2), 1 + 3(2), …
If we replace the first term by $a_1$ and the common difference by d then the above sequence can be written as: a, a + d, a + 2d, a + 3d, a + 4d, …
Explain the given sequence to students and tell them that from this we can construct the general formula as:

$a_1 = a$ $a_2 = a + d = a + (2 – 1)d$ $a_3 = a + 2d = a + (3 – 1)d$ $a_4 = a + 3d = a + (4 – 1)d$ etc.

Instruct students to observe the terms of the sequence and tell them that in each of these terms, the coefficient of d is 1 less than the index of the term. So we can construct the nth term of the sequence such that the coefficient of the d would be (n – 1) so the nth term of the sequence is: $a_n = a + (n – 1)d$
This is the general term of the sequence. Encourage students to ask question if they have any confusion. Explain the construction of general formula by writing different arithmetic sequence and then find the general term for that sequence. Tell them that by using the general term of an arithmetic sequence we can find any term of the sequence by putting values in the given formula.

**Sum Up: (3 min)**

Sum up the lesson by re-telling students how we can construct the formula for general term or nth term of an arithmetic sequence.

**Assessment: (10 min)**

To assess students' understanding instruct them to construct the general term of the arithmetic sequence give in Q4 (a, b, c) of "Learning Check 5.1" given at page 81 of their textbook.

**Homework: (2 min)**

Solve Q4 (d, e, f) of "Learning Check 5.1" given at page 81 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 1 **Lesson Plan:** 5

**Unit Name:** Sequence and Algebra **Topic:** General Term of an Arithmetic sequence **Date**: ___

## Objective(s):

**At the end of this period, the students will be able to:**

Apply the formula for the general term (nth term) of an arithmetic sequence.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 79, 80 and 81

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaam u Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: What is the arithmetic sequence and how we can construct general term for the arithmetic sequence? What is the general term for the arithmetic sequence? Take their responses and appreciate them for their correct response.

**Main Activities/Concept Building:** **(22 min)**

Tell students today we will learn how to apply the formula for the general term of an arithmetic sequence to find given term of the sequence. Instruct students to open their textbook page 79 of their textbook and read the statement of worked example 1 and tell what is given and what we have to find. Take their responses and tell them that the table shows the rental amount paid by a customer for renting a car for some period of time is given and we have to find rental amount for 12th month if the sequence continues in the same pattern. Ask students to observe the sequence and then find the common difference between two consective terms. Take their responses and then find the common difference:

| Month | Rental amount (in Rs) |
|---|---|
| 1 | 7500 |
| 2 | 9000 |
| 3 | 10500 |
| 4 | 12000 |

9000 – 7500 = 1500, 10500 – 9000 = 1500

As the first term of the sequence is 7500 and the common difference is 1500 then by putting values in the general term of the sequence we can find the rental amount of 12th month.

$$a_n = a_1 + (n - 1)d$$

Tell them that here we put n = 12 and d = 1500 and $a_1$ = 7500 in the given formula we get:

$$A_{12} = 7500 + (12 - 1)1500 = 7500 + 11(1500) = 7500 + 16500 = 24000$$

So the rental amount for 12th month is Rs 24000.

Solve the example step by step on the board and explain it them. Encourage them to ask question if they have any confusion. For more clarification solve worked example 2 and 3 on the board and explain it to students.

**Activity:**

Present the students with a real-world scenario that involves an arithmetic sequence, such as a savings plan, where a person deposits a fixed amount of money regularly into a bank account. Example scenario: Asim starts saving money in a bank account with an initial deposit of Rs5000. Every month, he adds an additional Rs2000 to his savings account. Explain that we can model this scenario as an arithmetic sequence, where the first term (a) is Rs 5000 (initial deposit) and the common difference (d) is Rs 2000 (monthly deposit). Instruct the students to find the amount of money Asim will have saved after a certain number of months (n) using the general term formula. Divide the class into small groups and have them work together to calculate the savings for different values of n. For example, find the savings after 6 months (n = 6), 12 months (n = 12), and 24 months (n = 24). Walk around and check their work and guide them where required. Discuss with them about their common mistakes.

**Sum Up:** **(3 min)**

Sum up the lecture by repeating what is the arithmetic sequence and the general term for the arithmetic sequence to find any specific term of the sequence if the first term and the common difference is known.

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Assessment:** **(8 min)**

To assess students' understanding instruct them to solve "Pause and Try" given at page 80 and Q5, Q6 and Q7 of "Learning Check 5.1" given at page 81 of their textbook.

**Homework:** **(2 min)**

Solve Q8 and Q9 of "Learning Check 5.1" given at page 81 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 1 **Lesson Plan:** 6

**Unit Name:** Sequence and Algebra **Topic:** Polynomials and Factorization **Date**: _____

## Objective(s):

**At the end of this period, the students will be able to:**

Recall the difference between:

o open and close sentences o expression and equation o equation and inequality

## Resource Material:

Chalk/Marker, White/Blackboard, textbook page 81 and 85

## Teaching & Learning Activities:

**Opening Activities/Warm-up: (8 min)**

Say, “Assalaam u Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Begin the lesson by asking students about they have learnt in previous lesson. Ask students: How we can find nth term of the arithmetic sequence? Write some arithmetic sequences on the board and instruct students to find the 21st, 29th and 35th term of the sequence. Walk around, check their work and guide them where required.

**Main Activities/Concept Building: (20 min)**

Begin the lesson by asking students if they remember the terms open and close sentences, expressions and equations, and equations and inequalities. Briefly discuss any prior knowledge they may have on these topics. Explain that today's lesson will focus on recalling and understanding the differences between open and closed sentence. Ask students: Do you know what is open and closed sentence? Take their response and then write two sentences on the board that is: 3 + 7 = 10, x + 5 = 10

Tell them that the sentence 3 + 7 = 10 is closed sentence as it is true. The sentence that either true or false is closed sentence. But x + 5 = 10 is not a closed sentence as it involves the variable whose value is not known. Tell them that a statement (or sentence) that does not include enough information required to decide whether it is true or false is known as an open statement. Explain that now we will recall and understand the concept of expression, equation and inequality. Tell them that an algebraic expression is a combination of combination of variables, constants, coefficients, exponents and symbols of operations, i.e., + and – for example 3x + 4, 2y – 2 etc. Tell them that an equation is a mathematical statement that shows the equality of two expressions, while an inequality shows that one expression is less than or more than the other. Explain the expression, equation and inequality by writing different examples on the board. Instruct students to open their textbook page 81 and learn more about open sentence, closed sentence, expression, equation and inequality. Encourage students to ask questions if they have any confusion.

**Activity:**

Have students open textbook page 85. Write statement of Q1 on the board. Solve it on the board by asking students to tell difference between open and closed sentences. Separate out the open and closed sentences from the given sentences. Then ask students to copy the solution on their notebook and ask questions if they are not clear about anything.

**Sum Up: (3 min)**

Sum up the lecture by repeating with students the terms open and closed sentences and difference between expression, equation and inequality. Also explain “Note to remember” given at page 81.

**Assessment: (7 min)**

To assess students ask them to tell what is the difference between: open and closed sentence, equation and expression and equation and inequalities.

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Homework:** **(2 min)**

Solve Q2 of “Learning check 5.2” given at textbook page 85.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 1 **Lesson Plan:** 7

**Unit Name:** Sequence and Algebra **Topic:** Addition of Polynomials **Date**: __ ____

**Objective(s):**

**At the end of this period, the students will be able to:**

Recall the addition of polynomials.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 82 and 85

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaam u Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Begin the lesson by asking students about their homework. Ask students: what is the difference between open and closed sentences? What is the difference between expression and equation? What is the difference between equation and inequalities? Take their responses and then write examples of equation, expressions and inequalities on the board and call a student to the front of the class and ask him/her to separate out expression, equation and inequality from the given. Ask the rest of the class to check and correct if required. Appreciate them for their good work.

**Main Activities/Concept Building:** **(22 min)**

Tell students today we will recall how to add two or more polynomials. Ask students: what is meant by polynomials? Take their responses and recall with them that polynomials are algebraic expressions in which the powers of variables are whole numbers. It means that all of the algebraic expressions are polynomials except those that possess negative or fractional exponents of the variables involved. Explain the polynomials by writing different examples on the board. Ask students to open their textbook page 82. Ask students: how we can add polynomials vertically and horizontally. Take their responses and write the worked example on the board that is”

“Find the sum of the following polynomials: $7x^4 – 5x^3 + 2x^2 – 5$, $4x^4 – 2x^3 + 4x$ and $7x^3 – 2x^2 + 3x + 11$”

Tell them that to add the polynomials, arrange them in such a way that the terms like terms are combined together. Then add them in the usual manner. Add the polynomials on the board and explain each step to students. Encourage students to ask questions where they found any confusion.

**Activity**

Divide the class into small groups. Provide each group with a set of polynomial expressions written on index cards or pieces of paper. Each set should contain different polynomial expressions with a mix of degrees and various like terms. Instruct each group to take two or three polynomials at a time and add them. After completing work review the steps involved in adding polynomials, emphasizing the importance of identifying like terms and combining them correctly. Discuss with them about their common mistakes. Appreciate them for their good work.

**Sum Up:** **(3 min)**

Sum up the lecture by retelling students how to add two or more polynomials by combining like terms and also explain “Note to remember” given at page 82 of their textbook.

**Assessment:** **(8 min)**

To assess students ask them to solve “pause and Try” given at page 82 and Q3 (a, b) of “Learning check 5.2” given at page 85 of textbook.

**Homework:** **(2 min)**

Solve Q3(c, d, e) of “Learning check 5.2” given at page 85 of textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 2 **Lesson Plan:** 1

**Unit Name:** Sequence and Algebra **Topic:** Subtraction of polynomials **Date**: _____

## Objective(s):

**At the end of this period, the students will be able to:**

Recall the subtraction of polynomials.

## Resource Material:

Chalk/Marker, White/Blackboard, textbook page 82 and 85

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students what is polynomial? How we can add polynomials? Take their responses and then write two polynomial expressions on the board and instruct students to add these polynomials in their notebooks. Walk around and check their work and guide them where required.

**Main Activities/Concept Building: (22 min)**

Tell students today we will recall how to subtract two polynomials. Recall the term polynomials with students. Explain the polynomials by writing different examples on the board. Ask students to open their textbook page 82. Ask students: how we can subtract polynomials vertically and horizontally. Take their responses and write the worked example on the board that is”

“Subtract the second polynomial from the first polynomial:

$15x^5 – 3x^4 – 6x^2 + 10x + 25, 7x^5 – 4x^3 + 12x^2 + 6x – 11$”

Tell them that to subtract the polynomials, first change the sign of the terms which are to be subtracted.

$15x^5 – 3x^4 – 6x^2 + 10x + 25 – 7x^5 + 4x^3 – 12x^2 – 6x + 11$

Explain to them after changing the sign group the like terms and then subtract.

$15x^5 – 7x^5 – 3x^4 + 4x^3 – 6x^2 – 12x^2 + 10x – 6x + 25 + 11$

$= 8x^5 – 3x^4 + 4x^3 – 18x^2 + 4x + 36$

Subtract the polynomials on the board and explain each step to students. Encourage students to ask questions where they found any confusion.

**Activity**

Divide the class into small groups. Provide each group with a set of polynomial expressions written on index cards or pieces of paper. Each set should contain different polynomial expressions with a mix of degrees and various like terms. Instruct each group to take two polynomials at a time and subtract them. After completing work review the steps involved in subtracting polynomials, emphasizing the importance of identifying like terms and combining them correctly. Discuss with them about their common mistakes. Appreciate them for their good work.

**Sum Up: (3 min)**

Sum up the lecture by retelling students first change the sign of the polynomial that to be subtracted and to subtract the like terms of two polynomials, just subtract their coefficients. The variables and powers of the like terms remain the same.

**Assessment: (8 min)**

To assess students ask them to solve “pause and Try” given at page 82 and Q6 of “Learning check 5.2” given at page 85 of textbook.

**Homework: (2 min)**

Solve Q7 of “Learning check 5.2” given at page 85 of textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 2 **Lesson Plan:** 2

**Unit Name:** Sequence and Algebra **Topic:** Multiplication of Polynomials **Date**: _____

## Objective(s):

**At the end of this period, the students will be able to:**

Recall the multiplication of polynomials.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 82, 83 and 85, worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students what is polynomial? How we can subtract two polynomials? Take their responses and then write two polynomial expressions on the board and instruct students to subtract the first polynomial from the second one in their notebooks. Walk around and check their work and guide them where required.

**Main Activities/Concept Building: (22 min)**

Tell students today we will recall how to multiply two polynomials. Tell students in previous class we have learnt about multiplication of monomial with monomials, binomial with monomials, binomials and trinomials. Recall with students the term monomials, binomials and trinomials. Ask students to open their textbook page 82 and 83. Ask students: how we can multiply polynomials. Take their responses and write the worked example 1 on the board that is: Multiply (x –2) and (x + 3).

Tell students as the given polynomials have two terms so these are binomials. Explain to them that when we multiply a binomial with a binomial/trinomial, multiply each term of the binomial by each term of the binomial/trinomial and simplify by adding or subtracting like terms. Now multiply the given polynomials on the board step by step and explain each step to them.

$$(x - 2)(x + 3) = x(x + 3) - 2(x + 3)$$
$$= x^2 + 3x - 2x - 6$$
$$= x^2 + x - 6$$

Encourage students to ask questions if they have any confusion. For more clarification solve worked example 2 on the board step by step and explain to them.

**Activity**

Divide the class into three groups. Write parts of Q4 of “Learning check 5.2” given at page 85 on the paper slips. Provide two paper slips to each group. Instruct to multiply the given polynomials. Walk around the class and check their work. Guide them where needed. Then call one by one each group to the front of the class and instruct to show their working to the whole class. Discuss with them about their common mistakes and then instruct to write those questions and their solutions in their notebooks. Appreciate them for their good work.

**Sum Up: (3 min)**

Sum up the lecture by retelling students how we can multiply two or more polynomials. Discuss with them the terms monomials, binomials and trinomials.

**Assessment: (8 min)**

To assess students ask them to solve “pause and Try parts (a, b)” given at page 83.

**Homework: (2 min)**

Solve the given worksheet.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

# Worksheet

**Name: _____** **Date: _____**

1. **Multiply the following.**

a) $(3x + 4y)(2x + 9y)$

b) $(3a + b)(a – 7b)$

c) $(9 – 2y)(5x + 7y)$

d) $(11x – 2y)(z – 4x)$

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 2 **Lesson Plan:** 3

**Unit Name:** Sequence and Algebra **Topic:** Division of Polynomials **Date**:

## Objective(s):

**At the end of this period, the students will be able to:**

Divide a polynomial by a monomial.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 83, 84 and 85, Worksheet

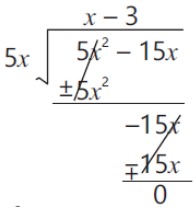
## Teaching & Learning Activities:

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaam u Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Begin the lesson by asking students what they have learnt previous day. Write two polynomials on the board. Call a student to the front of the class and ask him/her multiply these polynomials. Ask the rest of the class to check and correct if needed. Repeat this activity to some other students of the class. Appreciate them for their active participation.

**Main Activities/Concept Building:** **(25 mins)**

Tell students today we will learn how to divide a polynomial by monomials. Recall with students the term monomial that is the polynomial with one term is called monomial. Ask students: Do you know how to divide a polynomial by monomials. Take their responses and appreciate if someone gives the right answer. Ask students to open their textbook page 83 and write the statement of the worked example 1 that is:




“Divide $5x^2 – 15x$ by $5x$” on the board. To divide the polynomial by monomial first we take the first term of the polynomial and divide it by monomial. Here the first term is $5x^2$, to divide $5x^2$ by $5x$, we multiply $5x$ with $x$ and we get $5x^2$. So write $x$ in the quotient and $5x^2$ below the dividend and subtract. Then take the second term of the polynomial and divide it in the same way by monomial and the polynomial of the quotient is the result of division. Explain each step of division of polynomial by monomials and encourage students to ask questions if they have any confusion. For more clarification solve worked example 2 and 4 on the board and explain each step of division to students.

**Activity:**

Divide the class into pairs. Provide each pair with a set of polynomial expressions to divide by monomials. These expressions can include various degrees and monomials. Instruct each pair to work together to divide the given polynomial expressions by the monomials following the steps demonstrated earlier. Circulate around the classroom to assist and support students as they work through the problems. Gather the class back together and review the process of dividing a polynomial by a monomial. Ask students to share their answers and explain their thought process for solving the division problems. Emphasize the importance of organizing their work and simplifying the expressions correctly.

**Sum Up:** **(3 min)**

Sum up the lecture by retelling about the how to divide a polynomials with monomials. Also explain the “Note to Remember” given at page 83 and 84 of their textbook.

**Assessment:** **(5 min)**

To assess students ask them to solve Q5 (f) of “Learning Check 5.2” given at page 85 of their textbook.

**Homework:** **(2 min)**

Complete the given worksheet.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

# Worksheet

**Name: _____** **Date: _____**

1. **Divide the following.**
   a) $2a^3 + 4a^2 + 6a$ by $2a$

   b) $6x^4 + 3x^3 + 12x^2 + 9x + 15$ by $3x$

   c) $7y^3 + 18y^2 + 9y + 9$ by $y$.

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 2 **Lesson Plan:** 4

**Unit Name:** Sequence and Algebra **Topic:** Division of Polynomials **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Divide a polynomial by a binomial.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 83, 84 and 85

## Teaching & Learning Activities:

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaam u Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Begin the lesson by asking students about their homework. Ask students: How we can divide polynomials by monomials. Take their responses and instruct students to write a polynomial and a monomial of your own choice and divide the polynomial by monomial. Walk around and monitor their working and correct them where needed. Appreciate them for their good work.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will learn how to divide a polynomial by binomials. Recall with students the term binomial that is the polynomial with two terms is called binomial. Ask students: Do you know how to divide a polynomial by binomial. Take their responses and appreciate if someone gives the right answer. Ask students to open their textbook page 84 and write the statement of the worked example 3 that is: "Divide $x^5 - y^5$ by $x - y$" on the board. To divide the polynomial by binomial first we take the first term of the polynomial and divide it by binomial. Here the first term is $x^5$, to divide $x^5$ by $x - y$, we multiply $x - y$ with $x^4$ and we get $x5 - x^4y$. So write x4 in the quotient and $x^5 - x^4y$ below the dividend and subtract. Divide the each term of the remainder again by the divisor $x - y$ step by step and explain each step of division of polynomial by binomial and encourage students to ask questions if they have any confusion. For more clarification solve more examples related to division of polynomial by binomial on the board and explain each step of division to students.

$$
\begin{array}{r|l}
x^4+x^3y+x^2y^2+xy^3+y^4 & \\
\hline
x-y \;\big)\; x^5 - y^5 & \\
\pm x^5 \mp x^4y & \leftarrow x^4(x-y) \\
\hline
x^4y - y^5 & \\
\pm x^4y \mp x^3y^2 & \leftarrow x^3y(x-y) \\
\hline
x^3y^2 - y^5 & \\
\pm x^3y^2 - x^2y^3 & \leftarrow x^2y^2(x-y) \\
\hline
x^2y^3 - y^5 & \\
\pm x^2y^3 \mp xy^4 & \leftarrow xy^3(x-y) \\
\hline
xy^4 - y^5 & \\
\pm xy^4 - xy^5 & \leftarrow y^4(x-y) \\
\hline
0 &
\end{array}
$$

**Activity:**

Divide the class into three groups. Write parts of Q5 (excluding part f) of "Learning check 5.2" given at page 85 on the paper slips. Provide two paper slips to each group. Instruct to divide the given polynomials by binomials. Walk around the class and check their work. Guide them where needed. Then call one by one each group to the front of the class and instruct to show their working to the whole class. Discuss with them about their common mistakes and then instruct to write those questions and their solutions in their notebooks. Appreciate them for their good work.

**Sum Up:** **(3 min)**

Sum up the lecture by retelling about the how to divide a polynomials with binomials. Also explain the "Note to Remember" given at page 84 of their textbook.

**Assessment:** **(5 min)**

To assess students ask them to solve Pause and Try part c and d at page 83 and Pause and try at page 84 of their textbook in their notebooks.

**Homework:** **(2 min)**

Solve Q8 and Q9 of "Learning Check 5.2" given on page 85 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 2 **Lesson Plan:** 5

**Unit Name:** Sequence and Algebra **Topic:** Simplification of algebraic expressions **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Simplify algebraic expressions involving addition, subtraction, multiplication and division.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 86

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaam u Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Begin the lesson by asking students about their homework. Ask students: What is polynomial and its types with respect to terms? How we can divide a polynomial by monomials or binomials. Take their responses and then ask them to write a polynomial and a binomial and divide the polynomial by binomial step by step. Walk around and check their work and correct them where required.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will learn simplification of algebraic expression. Ask students do you know how we can simplify the algebraic expressions. Take their responses and tell them that by using BODMAS rule we can easily simplify the algebraic expressions. Instruct students to open their textbook page 86 and write the statement "Simplify $4x + [2(4x + 3) – \{(2 + 2x – 7x^2)(5 + 4x^2)\}]$" on the board and instruct them to observe the example. Tell them that first we solve the expression inside the brackets.

$= 4x + [2(4x + 3) - \{(10 + 8x^2 + 10x + 8x^3 - 35x^2 – 28x^4)\}]$

$= 4x + [8x + 6 – 10 – 8x^2 – 10x – 8x^3 + 35x^2 + 28x^4]$

Now combine the like terms together.

$= 4x + [+ 6 – 10 – 10x + 8x – 8x^3 + 35x^2 – 8x^2 + 28x^4]$

After combining add or subtract the like terms.

$= 4x + [–4 – 2x – 8x^3 + 27x^2 + 28x^4]$

$= 4x – 4 – 2x – 8x^3 + 27x^2 + 28x^4$

$= 28x^4 – 8x^3 + 27x^2 + 2x – 4$

Solve step by step on the board and explain each step to them. Encourage students to ask questions if they have any confusion. For more clarification solve worked example 2 on the board and explain each step to them.

**Activity:**

Have students open textbook page 86. Write statement of Q1 (a) on the board. Solve it on the board by asking students to tell the steps of solving it. Appreciate them for their correct steps. Then ask students to copy the solution in their notebook and ask questions if they are not clear about anything. Instruct to solve Q1 (b, c) of "Learning Check 5.3" in their notebooks. Wlak around and check their work, guide and correct them where required.

**Sum Up:** **(3 min)**

Sum up the lecture by retelling how we can simplify the algebraic expression using BODMAS rule.

**Assessment:** **(5 min)**

To assess students ask them to solve "Pause and Try" and Q1 (d, e) of "Learning Check 5.3" given on page 86 of their textbook. Walk around and check their work and guide them where required.

**Homework:** **(2 min)**

Solve Q1 (f, g) of "Learning Check 5.3" given on page 86 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 2 **Lesson Plan:** 6

**Unit Name:** Sequence and Algebra **Topic:** Algebraic Identities **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Recognise the identity and its proof $(a+b)^2 = a^2+b^2+2ab$.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 87

**Teaching & Learning Activities:**

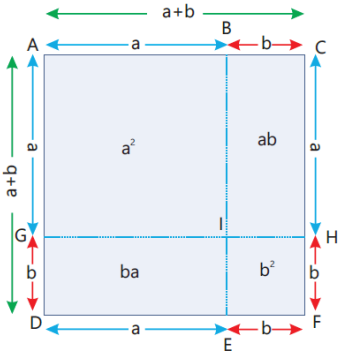
**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students:
How are you? Encourage them to say, "Alhamdulillah".
Begin the lesson by asking students about their homework. Ask students: what is meant by simplification? How we can simplify the algebraic expression? Take their responses and then write an algebraic expression on the board and ask students to simplify the given expression in their notebooks. Walk around and check their work and guide them where required.

**Main Activities/Concept Building:** **(25 mins)**

Tell students today we will recognise and proof of identity $(a + b)^2 = a^2 + b^2 + 2ab$. Ask students: Do you know what is meant by algebraic identity? Encourage students to share their ideas and explanations. After taking their responses tell them that as an equation is true for specific value of the variable but algebraic identity is true for all values of the variables. As we already learnt about the algebraic proof of this identity that is: $(a + b)^2 = (a + b)(a + b) = a^2 + ab + ba + b^2 = a^2 + ab + ab + b^2 = a^2 + 2ab + b^2$

Now we will learn about the geometric proof of this identity. Ask students to open their textbook page 87.




Draw a square ACFD on the board with length and width 'a + b' and divide it into four portions as given in the book. As we know that the area of the square is equal to the product of its length and width so:

Area of ACFD = Length of ACFD × Width of ACFD = $(a + b)(a + b) = (a + b)^2$

As the square is divided into four portions so area of the square ACFD is equal to the sum of the areas of each portion. Two portions are of square and two portions are of rectangle shape so the area of each portion is:

Area of ACFD = Area of ABIG + Area of IHCB + Area of DEIG + Area of EFHI

$(a + b)^2 = a \times a + a \times b + b \times a + b \times b$

$(a + b)^2 = a^2 + ab + ba + b^2$ (as ab = ba)

$(a + b)^2 = a^2 + 2ab + b^2$

So LHS is equal to the right hand side. Instruct students to open their textbook page 87 and prove the identity geometrically in their notebooks again. Walk around and check their working and guide them where required. Discuss with them about their common mistakes.

**Sum Up:** **(3 min)**

Sum up the lecture by retelling about the "identity I" and how we can prove it geometrically.

**Assessment:** **(5 min)**

To assess students ask them to prove the "identity I" algebraically and geometrically in their notebooks. Walk around and check their working.

**Homework:** **(2 min)**

Revise the classwork.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 2 **Lesson Plan:** 7

**Unit Name:** Sequence and Algebra **Topic:** Algebraic identities **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Apply the identity $(a+b)^2 = a^2+b^2+2ab$ to expand expressions and solve problems.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 87 and 90, paper slips

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (8 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah.

Ask students: How are you? Encourage them to say, "Alhamdulillah".

Begin the lesson by asking students about their homework. Ask students: how we can prove the identity $(a + b)^2 = a^2 + b^2 + 2ab$ geometrically. Draw a Square and divide it into four portions and name it and then ask students to prove the identity geometrically from the given figure. Walk around and check their work and guide them where required.

**Main Activities/Concept Building: (22 min)**

Tell students today we will learn about how we apply the identity "$(a + b)^2 = a^2 + b^2 + 2ab$"to expand the algebraic expression and solve them. Ask students: Do you know how we apply the given identity to expand the algebraic expressions? Encourage students to share their ideas and explanations. After taking their responses instruct students to open their textbook page 87 and ask them to read the statement of the worked example 1. Write the statement "Find the square of 4p + 8q" on the board and solve step by step on the board and explain each step to them.

$(a + b)^2 = a^2 + 2ab + b^2$

$(4p + 8q)^2 = (4p)^2 + 2\ (4p)\ (8q) + (8q)^2$

$= 16p^2 + 64pq + 64q^2$

For more explanation solve different worked example 2 and 3 on the board and encourage students to ask questions if they have any confusion.

**Activity:**

Prepare slips of paper with a variety of algebraic expressions involving squared binomials for example "$(x + 3)^2$, $(2a - b)^2$, $(y + 2)^2$, $(3x + 5)^2$ etc. Ensure that the expressions are suitable for the grade level and gradually increase in complexity. Divide the students into pairs, ensuring each pair has access to a set of slips of paper. Hand out the index cards with the algebraic expressions to each pair. Instruct the students to apply the algebraic identity $(a + b)^2 = a^2 + b^2 + 2ab$ to expand each expression on their paper slip. Invite each pair to present one of the expressions they expanded on the whiteboard. As the pairs present, ask them to explain the process and the steps they followed to apply the identity. Encourage the rest of the class to ask questions or provide feedback. Address any common mistakes or misconceptions that arose during the activity.

**Sum Up: (3 min)**

Sum up the lecture by retelling how we can apply the identity '$(a + b)^2 = a^2 + b^2 + 2ab$' to expand expressions and solve different problems by solving examples on the board.

**Assessment: (5 min)**

To assess students ask them to solve "Pause and Try" at page 87 and Q1(a, f, h) of "Learning Check 5.4" given on page 89 of their textbook. Walk around and check their work and guide them where required.

**Homework: (2 min)**

Solve Q3 and Q4 of "Learning Check 5.4" given on page 90 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 3 **Lesson Plan: 1**

**Unit Name:** Sequence and Algebra **Topic:** Algebraic Identities **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Recognise the identity and its proof $(a-b)^2 = a^2+b^2-2ab$.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 88

**Teaching & Learning Activities:**

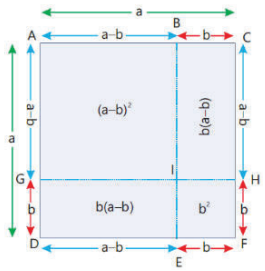
**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students: Do you know about the algebraic identity "$(a + b)^2 = a^2 + b^2 + 2ab$"? How we can use this identity to expand the algebraic expressions? Take their responses and then write an algebraic binomial expression for example $(3x + 4y)^2$ on the board and call a student to the front of the class and ask him/her to expand the given algebraic expression using the identity. Ask the rest of the class to check whether he/she correct or not. Repeat this activity to some other students of the class.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will recognise and proof of identity $(a - b)^2 = a^2 + b^2 - 2ab$. Ask students: Do you know what is meant by algebraic identity? Encourage students to share their ideas and explanations. After taking their responses tell them that as an equation is true for specific value of the variable but algebraic identity is true for all values of the variables. As we already learnt about the algebraic proof of this identity that is: $(a - b)^2 = (a - b)(a - b) = a^2 - ab - ba + b^2 = a^2 - ab - ab + b^2 = a^2 - 2ab + b^2$

Now we will learn about the geometric proof of this identity. Ask students to open their textbook page 88. Draw a square ACFD on the board with length and width 'a' and divide it into four portions as given in the book. As we know that the area of the square is equal to the product of its length and width so:




Area of ACFD = Length of ACFD × Width of ACFD = (a)(a) = $a^2$

As the square is divided into four portions so area of the square ACFD is equal to the sum of the areas of each portion. Two portions are of square and two portions are of rectangle shape so the area of each portion is:

Area of ACFD = Area of ABIG + Area of IHCB + Area of DEIG + Area of EFHI

$a^2 = (a - b)^2 + b(a - b) + b(a - b) + b^2$

$a^2 = (a - b)^2 + b^2 + 2b(a - b)$

$a^2 = (a - b)^2 + b^2 + 2ab - 2b^2$

$a^2 = (a - b)^2 - b^2 + 2ab$

$(a - b)^2 = a^2 + b^2 - 2ab$

Instruct students to open their textbook page 88 and prove the identity geometrically in their notebooks again. Walk around and check their working and guide them where required.

**Sum Up:** **(3 min)**

Sum up the lecture by retelling about the "identity II" and how we can prove it geometrically.

**Assessment:** **(5 min)**

To assess students ask them to prove the "identity II" algebraically and geometrically in their notebooks. Walk around and check their working.

**Homework:** **(2 min)**

Revise the classwork.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 3 **Lesson Plan: 2**

**Unit Name:** Sequence and Algebra **Topic:** Algebraic identities **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Apply the identity $(a - b)^2 = a^2 + b^2 - 2ab$ to expand expressions and solve problems.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 88 and 90, Paper slips or index cards

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (8 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah.

Ask students: How are you? Encourage them to say, "Alhamdulillah".

Begin the lesson by asking students about their homework. Ask students: how we can prove the identity II $(a - b)^2 = a^2 + b^2 - 2ab$ geometrically. Draw a Square and divide it into four portions and name it and then ask students to prove the identity geometrically from the given figure. Walk around and check their work and guide them where required.

**Main Activities/Concept Building: (22 min)**

Tell students today we will learn about how we apply the identity "$(a - b)^2 = a^2 + b^2 - 2ab$"to expand the algebraic expression and solve them. Ask students: Do you know how we apply the given identity to expand the algebraic expressions? Encourage students to share their ideas and explanations. After taking their responses instruct students to open their textbook page 88 and ask them to read the statement of the worked example 1. Write the statement "Evaluate the following i) $(p - 2q)^2$" on the board and solve step by step and explain each step to them.

$(a - b)^2 = a^2 - 2ab + b^2$

$(p - 2q)^2 = (p)^2 - 2\,(p)\,(2q) + (2q)^2$

$= p^2 - 4pq + 4q^2$

For more explanation solve different worked example 1 parts ii and 2 on the board and encourage students to ask questions if they have any confusion.

**Activity:**

Prepare index cards or slips of paper with a variety of algebraic expressions involving squared binomials for example "$(1 - a)^2$, $(2x - y)^2$, $(y - 5)^2$, $(9a - 2b)^2$ etc. Ensure that the expressions are suitable for the grade level and gradually increase in complexity. Divide the students into pairs, ensuring each pair has access to a set of index cards or slips of paper. Hand out the index cards with the algebraic expressions to each pair. Instruct the students to apply the algebraic identity $(a - b)^2 = a^2 + b^2 - 2ab$ to expand each expression on their index cards. Invite each pair to present one of the expressions they expanded on the whiteboard. As the pairs present, ask them to explain the process and the steps they followed to apply the identity. Encourage the rest of the class to ask questions or provide feedback. Address any common mistakes or misconceptions that arose during the activity.

**Sum Up: (3 min)**

Sum up the lecture by retelling how we can apply the identity '$(a - b)^2 = a^2 + b^2 - 2ab$' to expand expressions and solve different problems by solving examples on the board.

**Assessment: (5 min)**

To assess students ask them to solve "Pause and Try" at page 88 and Q1 (d, e, i) of "Learning Check 5.4" given on page 89 of their textbook. Walk around and check their work and guide them where required.

**Homework: (2 min)**

Solve Q2 (a, b, c, e, f, g), Q4 and Q7 of "Learning Check 5.4" given on page 90 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 3 **Lesson Plan: 3**

**Unit Name:** Sequence and Algebra **Topic:** Algebraic Identities **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Recognise the identity and its proof $(a + b)(a - b)=a^2 - b^2$.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 89

**Teaching & Learning Activities:**

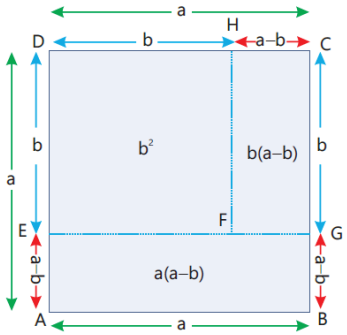
**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students: Do you know about the algebraic identity "$(a - b)^2 = a^2 + b^2 - 2ab$"? How we can use this identity to expand the algebraic expressions? Take their responses and then write an algebraic binomial expression for example $(2x - 7y)^2$ on the board and call a student to the front of the class and ask him/her to expand the given algebraic expression using the identity. Ask the rest of the class to check whether he/she correct or not. Repeat this activity to some other students of the class.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will recognise and proof of identity $(a - b)(a + b) = a^2 - b^2$. Ask students: Do you know what is meant by algebraic identity? Encourage students to share their ideas and explanations. After taking their responses tell them that as an equation is true for specific value of the variable but algebraic identity is true for all values of the variables. As we already learnt about the algebraic proof of this identity that is: $(a - b)(a + b) = a^2 - ab + ba - b^2 = a^2 - ab + ab - b^2 = a^2 - b^2$

Now we will learn about the geometric proof of this identity. Ask students to open their textbook page 89.




Draw a square ABCD on the board with length and width 'a' and divide it into three portions as given in the book. As we know that the area of the square is equal to the product of its length and width so:

Area of ABCD= Length of ABCD × Width of ABCD = (a)(a) = $a^2$

As the square is divided into three portions so area of the square ABCD is equal to the sum of the areas of each portion. Two portions are of rectangle and one portion is of square shape so the area of each portion is:

Area of ABCD = Area of EFHD + Area of FGCH + Area of ABGE

$$a^2 = b^2 + b(a - b) + a(a - b)$$

$$a^2 = b^2 + (a + b)( a - b)$$

$$a^2 - b^2 = (a + b)(a - b)$$

Instruct students to open their textbook page 89 and prove the identity geometrically in their notebooks again. Walk around and check their working and guide them where required.

**Sum Up:** **(3 min)**

Sum up the lecture by retelling about the "identity III" and how we can prove it geometrically.

**Assessment:** **(5 min)**

To assess students ask them to prove the "identity III" algebraically and geometrically in their notebooks. Walk around and check their working.

**Homework:** **(2 min)**

Revise the classwork.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 3 **Lesson Plan:** 4

**Unit Name:** Sequence and Algebra **Topic:** Algebraic identities **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Apply the identity $(a+b)(a-b)=a^2-b^2$ to expand expressions and solve problems.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 88 and 90, Paper slips or index cards

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(8 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah.

Ask students: How are you? Encourage them to say, "Alhamdulillah".

Begin the lesson by asking students about their homework. Ask students: how we can prove the identity II $(a - b)^2 = a^2 + b^2 - 2ab$ geometrically. Draw a Square and divide it into four portions and name it and then ask students to prove the identity geometrically from the given figure. Walk around and check their work and guide them where required.

**Main Activities/Concept Building:** **(22 min)**

Tell students today we will learn about how we apply the identity "$(a - b)(a + b) = a^2 - b^2$"to expand the algebraic expression and solve them. Ask students: Do you know how we apply the given identity to expand the algebraic expressions? Encourage students to share their ideas and explanations. After taking their responses instruct students to open their textbook page 88 and ask them to read the statement of the worked example 1. Write the statement "Simplify the following i) (x + 6)(x – 6)" on the board and solve step by step and explain each step to them.

$(a + b)(a – b) = a^2 – b^2$

$(x + 6)(x – 6)" = (x)^2 – (6)^2$

$= x^2 – 36$

For more explanation solve different worked example 1 parts ii and 2 on the board and encourage students to ask questions if they have any confusion.

**Activity:**

Prepare index cards or slips of paper with a variety of algebraic expressions involving squared binomials for example "(2 + 4x)(2 – 4x), (5a + 2b)(5a – 2b), etc. Ensure that the expressions are suitable for the grade level and gradually increase in complexity. Divide the students into pairs, ensuring each pair has access to a set of index cards or slips of paper. Hand out the index cards with the algebraic expressions to each pair. Instruct the students to apply the algebraic identity $(a – b)(a + b) = a^2 – b^2$ to expand each expression on their index cards. Invite each pair to present one of the expressions they expanded on the whiteboard. As the pairs present, ask them to explain the process and the steps they followed to apply the identity. Encourage the rest of the class to ask questions or provide feedback. Address any common mistakes or misconceptions that arose during the activity.

**Sum Up:** **(3 min)**

Sum up the lecture by retelling how we can apply the identity '$(a + b)(a – b) = a^2 – b^2$' to expand expressions and solve different problems by solving examples on the board.

**Assessment:** **(5 min)**

To assess students ask them to solve Q1 (b, c, g) of "Learning Check 5.4" given on page 89 of their textbook. Walk around and check their work and guide them where required.

**Homework:** **(2 min)**

Solve Q2 (d, h), Q5 and Q6 of "Learning Check 5.4" given on page 89 and 90 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 3 **Lesson Plan:** 5

**Unit Name:** Sequence and Algebra **Topic:** Factorization **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Factorize the following types of expressions: ka + kb + kc.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 90 and 92, Paper slips

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work. Ask the students about their homework. Ask students about what they have learnt yesterday. Ask them how we can simplify the algebraic expression using the identity $(a + b)(a – b) = a^2 – b^2$. After taking their response write an algebraic expressions $(4x + 5y)(4x – 5y)$ and $47 \times 50$ on the board and ask them to simplify the given expression in their notebooks. Walk around and check their work and guide them where needed.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will learn to factorize the algebraic expression of the form Ka +kb + kc. Ask students: Do you know about what is factorization? Take their responses and tell them that like whole numbers we can also find the factors of the algebraic expressions and the process of finding the factors of algebraic expression is called factorization. When we multiply the factors, we again get the algebraic expression. Tell students the expressions like Ka + kb + kc we have a number, a variable or the product of number and variable common to all terms of the given algebraic expression. For such types of algebraic expressions, there are two factors: one is the common factor of all terms, and the other is the quotient obtained by dividing the given algebraic expression by the common factor. Instruct students to open their textbook page 90 and read the statement of the worked example 'part a' that is factorize 2x + 2y + 2z. Ask students to observe the expression as 2 is common in all terms of the expression so we take 2 as common factor.
$2x + 2y + 2z = 2(x + y + z)$
Tell students that 2 and x + y + z are the factors of the expression 2x + 2y + 2z. For more explanation solve the part b on the board step by step and explain it to them.

**Activity:**

Divide the class into pairs or small groups and ensure each group has access to slips of paper with different expressions of the form ka + kb + kc. Explain to the students that they will work together to factorize these expressions using the factorization procedure discussed earlier. Begin a group discussion, asking each group to explain the factorization steps they took for one of the expressions on the board. Encourage other groups to ask questions or provide feedback on the factorizations presented. Clarify any misconceptions and reinforce the correct factorization procedure.

**Sum Up:** **(3 min)**

Sum up the lesson by emphasizing students how we can factorize the expression of the form ka + kb + kc and also explain "Note to remember" given at page 90 of their textbook.

**Assessment:** **(5 min)**

To assess students ask them solve Q1 (a, b, c) of "Learning check 5.5" given at page 92 of their textbook.

**Homework:** **(2 min)**

Solve Q1 (d, e, f, g, h, i, j) of "Learning check 5.5" given at page 92 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 3 **Lesson Plan:** 6

**Unit Name:** Sequence and Algebra **Topic:** Factorization **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Factorize the following types of expressions: ac + ad + bc + bd.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 90, 91 and 92, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask the students: How are you? Encourage them to say, “Alhamdulillah”. Start with ‘Bismillah’ and tell them to recite it before starting any work. Ask the students about their homework. Ask students about what they have learnt yesterday. Ask them how we can factorize the algebraic expression of the form ka + kb + kc. After taking their response write an algebraic expression 4x + 12y + 16z on the board and ask them to factorize the given expression in their notebooks. Walk around and check their work and guide them where needed. Repeat this activity by writing some other algebraic expressions on the board.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will learn to factorize the algebraic expression of the form ac + ad + bc + bd. Ask students: Do you know about what is factorization? Take their responses and tell them that like whole numbers we can also find the factors of the algebraic expressions and the process of finding the factors of algebraic expression is called factorization. When we multiply the factors, we again get the algebraic expression. Instruct students to open their textbook page 90. Tell them that the expressions like ac + ad + bc + bd, all terms of the expression do not have common factor. However, certain groups of terms possess a common factor. The process of factorization is completed by taking common factors. Instruct students to observe the algebraic expression ac + ad + bc + bd, all term of this expression do not have common factors, in first two terms of the expression a is the common factor and in the last two terms of the expression b is the common factor. We can write it as: ac + ad + bc + bd = a(c + d) + b(c + d) = (c + d)(a + b)

For more explanation solve the worked example given at page 91 of their textbook on the board that is: Factorize the given expression: ax + ay – 5x – 5y. Instruct students to observe the expression and tell what is common in terms of the expression. Take their responses and tell them that ‘a’ is common in the first two terms and ‘– 5’ is common in the last two terms. ax + ay – 5x – 5y = a( x + y) – 5( x + y) = ( x + y)(a – 5) Explain step by step example to students and encourage them to ask question if they have any confusion.

**Activity:**

Divide the class into pairs or small groups and ensure each group has access to index cards or slips of paper with different expressions of the form ac +ad + bc + bd. Explain to the students that they will work together to factorize these expressions using the factorization procedure discussed earlier. Begin a group discussion, asking each group to explain the factorization steps they took for one of the expressions on the board. Encourage other groups to ask questions or provide feedback on the factorizations presented. Clarify any misconceptions and reinforce the correct factorization procedure.

**Sum Up:** **(3 min)**

Sum up the lesson by re-telling students how we can factorize the expression of the form ac + ad + bc + bd.

**Assessment:** **(5 min)**

To assess students ask them solve Q1 (k, l) of “Learning check 5.5” given at page 92 of their textbook.

**Homework:** **(2 min)**

Complete the given worksheet.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

# Worksheet

**Name: _____** **Date: _____**

1. **Factorize the following.**
   a) $2a^2 + 3ab + 4ac + 6bc$

   b) $5xy + 2xz + 35yw + 14zw$

   c) $2m^2n + 3mn^2 + 4mp^2 + 6np^2$

   d) $3x^2 + 6xy + 2xz + 4yz$

   e) $4a^2b + 5ab^2 + 16ac^2 + 20bc^2$

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 3 **Lesson Plan:** 7

**Unit Name:** Sequence and Algebra **Topic:** Factorization **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Factorize the following types of expressions: $a^2 \pm 2ab + b^2$.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 91 and 93

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work. Ask the students about their homework. Ask students about what they have learnt yesterday. Ask them how we can factorize the algebraic expression of the form ac + ad + bc + bd. After taking their response write an algebraic expression $2x + 4y + 6xy + 12y^2$ on the board and ask them to factorize the given expression in their notebooks. Walk around and check their work and guide them where needed. Repeat this activity by writing some other algebraic expressions on the board.

**Main Activities/Concept Building: (25 min)**

Tell students today we will learn to factorize the algebraic expression of the form $a^2 \pm 2ab + b^2$. Ask students: Do you know about what is factorization? Take their responses and tell them the process of finding the factors of algebraic expression is called factorization. When we multiply the factors, we again get the algebraic expression. Instruct students to open their textbook page 91. Tell them that the expressions like $a^2 \pm 2ab + b^2$, we known that $(a + b)^2 = a^2 + 2ab + b^2$ and $(a – b)^2 = a^2 – 2ab + b^2$ are basic algebraic identities. If an algebraic expression is a perfect square, its factorization can be done with the help of these identities. Write the worked example factorize the algebraic expressions $4x^2 + 12x + 9y^2$ on the board. Ask students to observe the given expression. Is the given expression is in form of $a^2 + 2ab + b^2$ or $a^2 – 2ab + b^2$? Take their responses and tell them that to check the given expression is in the form of perfect square first observe expression have three terms, the first and third term of the expression is perfect square and the middle term is twice the product of the square roots of the perfect squares. Now solve the example step by step on the board and explain it to them.

$4x^2 + 12x + 9y^2 = (2x)^2 + 2(2x)(3y) + (3y)^2 = (2x + 3y)^2 = (2x + 3y)(2x + 3y)$

For more explanation solve the worked example part b on the board step by step and encourage them to ask questions if they have any confusion.

**Activity:**

Divide the class into pairs or small groups and ensure each group has access to index cards or slips of paper with different expressions of the form $a^2 \pm 2ab + b^2$. Explain to the students that they will work together to factorize these expressions using the factorization procedure discussed earlier. Begin a group discussion, asking each group to explain the factorization steps they took for one of the expressions on the board. Encourage other groups to ask questions or provide feedback on the factorizations presented. Clarify any misconceptions and reinforce the correct factorization procedure.

**Sum Up: (3 min)**

Sum up the lesson by re-telling students how we can factorize the expression of the form $a^2 \pm 2ab + b^2$.

**Assessment: (5 min)**

To assess students ask them solve Q2 (a-e) of "Learning check 5.5" given at page 93 of their textbook.

**Homework: (2 min)**

Solve "Pause and Try" at page 91 and Q2 (f-j) of "Learning check 5.5" given at page 93 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 4 **Lesson Plan:** 1

**Unit Name:** Sequence and Algebra **Topic:** Factorization **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Factorize the following types of expressions: $a^2 - b^2$.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 91 and 92, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work. Ask the students about their homework. Ask students about what they have learnt yesterday. Ask them how we can factorize the algebraic expression of the form $a^2 \pm 2ab + b^2$. After taking their response write an algebraic expression $4a^2 - 12ab + 9b^2$ on the board and ask them to factorize the given expression in their notebooks. Walk around and check their work and guide them where needed. Repeat this activity by writing some other algebraic expressions on the board.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will learn to factorize the algebraic expression of the form $a^2 - b^2$. Ask students: Do you know about what is factorization? Take their responses and tell them the process of finding the factors of algebraic expression is called factorization. When we multiply the factors, we again get the algebraic expression. Instruct students to open their textbook page 91. Tell them that the expressions like $a^2 - b^2$, we known that $a^2 - b^2 = (a + b)(a - b)$ is basic algebraic identity. If an algebraic expression is in form of $a^2 - b^2$ then it can be factorize by using this identity.

Write the worked example part a factorize the algebraic expressions $4a^2 - 25b^2$ on the board. Ask students to observe the given expression. Is the given expression is in form of $a^2 - b^2$? Take their responses and tell them that to check the given expression is in the form of $a^2 - b^2$ first observe expression have two terms and both terms of the expression are perfect squares. Now solve the example step by step on the board and explain it to them.

$4a^2 - 25b^2 = (2a)^2 - (5b)^2 = (2a - 5b)(2a + 5b)$

For more explanation solve the worked example part b given at page 92 on the board step by step and encourage them to ask questions if they have any confusion.

**Activity:**

Divide the class into pairs or small groups and ensure each group has access to index cards or slips of paper with different expressions of the form $a^2 - b^2$. Explain to students that they will work together to factorize these expressions using the factorization procedure discussed earlier. Begin a group discussion, asking each group to explain the factorization steps they took for one of the expressions on the board. Encourage other groups to ask questions or provide feedback on the factorizations presented. Clarify any misconceptions and reinforce the correct factorization procedure.

**Sum Up:** **(3 min)**

Sum up the lesson by re-telling students how we can factorize the expression of the form $a^2 - b^2$.

**Assessment:** **(5 min)**

To assess students ask them solve the given worksheet by following instructions. Walk around and check their work and guide them where required.

**Homework:** **(2 min)**

Revise the classwork.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

# Worksheet

**Name: _____** **Date: _____**

1. **Factorize the following.**

a) $4a^2 - 16b^2$

b) $25x^2 - \frac{1}{121}$

c) $m^2 - 49\,n^2$

d) $9y^2 - 36\,z^2$

e) $4a^2b^2 - c^2d^2$

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 4 **Lesson Plan:** 2

**Unit Name:** Sequence and Algebra **Topic:** Factorization **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Factorize the following types of expressions: $a^2 \pm 2ab + b^2 - c^2$.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 91 and 93, Paper slips, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work. Ask the students about their homework. Ask students about what they have learnt yesterday. Ask them how we can factorize the algebraic expression of the form $a^2 - b^2$. After taking their response write an algebraic expression $64t^2 - 81u^2$ on the board and ask them to factorize the given expression in their notebooks. Walk around and check their work and guide them where needed.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will learn to factorize the algebraic expression of the form $a^2 \pm 2ab + b^2 - c^2$. Ask students: Do you know about what is factorization? Take their responses and tell them the process of finding the factors of algebraic expression is called factorization. When we multiply the factors, we again get the algebraic expression. Instruct students to open their textbook page 92. Tell them that the expressions like $a^2 \pm 2ab + b^2 - c^2$, we known that $(a + b)^2 = a^2 + 2ab + b^2$ ,$(a - b)^2 = a^2 - 2ab + b^2$ and $a^2 - b^2 = (a + b)(a - b)$ are basic algebraic identities. If an algebraic expression is a perfect square, its factorization can be done with the help of these identities.

Write the worked example factorize the algebraic expressions $a^2 + 10ab + 25b^2 - 49c^2$ on the board. Ask students to observe the given expression. Is the given expression is in form of $a^2 + 2ab + b^2$ or $a^2 - 2ab + b^2$ or $a^2 - b^2$? Take their responses and tell them that to check the given expression is in the form of perfect square first observe expression have four terms, the first and third term of the expression is perfect square and the middle term is twice the product of the square roots of the perfect squares and the fourth term is also the perfect square. Now solve the example step by step on the board and explain it to them.

$a^2 + 10ab + 25b^2 - 49c^2 = (a)^2 + 2(a)(5b) + (5b)^2 - (7c)^2 = (a + 5b)^2 - (7c)^2 = (a + 5b + 7c)(a + 5b - 7c)$

For more explanation solve the worked example part b on the board step by step and encourage them to ask questions if they have any confusion.

**Activity:**

Divide the class into pairs or small groups and ensure each group has access to index cards or slips of paper with different expressions of the form $a^2 \pm 2ab + b^2 - c^2$. Explain to the students that they will work together to factorize these expressions using the factorization procedure discussed earlier. Begin a group discussion, asking each group to explain the factorization steps they took for one of the expressions on the board. Clarify any misconceptions and reinforce the correct factorization procedure.

**Sum Up:** **(3 min)**

Sum up the lesson by re-telling students how we can factorize the expression of the form $a^2 \pm 2ab + b^2 - c^2$.

**Assessment:** **(5 min)**

To assess students ask them solve the given worksheet. Walk round and check their work and guide if required.

**Homework:** **(2 min)**

Revise the classwork.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

# Worksheet

**Name: _____** **Date: _____**

1. **Factorize the following.**
   a) $9a^2 + 4b^2 – 16c^2 + 12ab$

   b) $81x^2 – 25y^2 + 169z^2 – 234xz$

   c) $36a^2 + 25b^2 + 60ab – c^2d^2$

   d) $49F^2 + g^2 –14fg – h^2i^2$

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week: 4** **Lesson Plan: 3**

**Unit Name:** Sequence and Algebra **Topic:** Cubic Identities **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Manipulate the algebraic expressions $(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 93, 94 and 95

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(7 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work. Ask the students about their homework. Ask them how we can factorize the algebraic expression of the form $a^2 \pm 2ab + b^2 - c^2$. After taking their response write an algebraic expression $4x^2 + 81y^2 - z^2 - 36xy$ on the board and ask them to factorize the given expression in their notebooks. Walk around and check their work and guide them where needed.

**Main Activities/Concept Building:** **(23 min)**

Begin the lesson by telling students today we will learn the cubic identity $(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$. Ask students: Do you know what is meant by cubic identity? Encourage students to share their ideas and explanations. Like algebraic identities the cubic identities are also true for all values of the variable. Now we will first prove the cubic identify $(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$. Explain students first take the LHS and prove that it is equal to the right hand side. As we know that $(a + b)^3 = (a + b)(a + b)(a + b)$, now we multiply it in the same way as we multiply binomial with binomials.

$(a + b)^3 = (a + b)\,(a + b)^2$

$(a + b)^3 = (a + b)\,(a^2 + 2ab + b^2)$

$(a + b)^3 = a\,(a^2 + 2ab + b^2) + b\,(a^2 + 2ab + b^2) = a^3 + 2a^2b + ab^2 + a^2b + 2ab^2 + b^3$

$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$

Instruct students to open their textbook page 93 and prove the identity in their notebooks again. For more clarification solve the worked example 1 part a "Find the cube of (2a + 3b) by using identity." Solve the given example step by step on the board and explain each step to them.

$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$

$(2a + 3b)^3 = (2a)^3 + 3(2a)^2(3b) + 3(2a)(3b)^2 + (3b)^3$

$= 8a^3 + 3\,(4a^2)\,(3b) + 6a(9b^2) + 27b^3 = 8a^3 + 36a^2b + 54ab^2 + 27b^3$

For more explanation solve worked example 2 on the board and encourage students to ask questions if they have any confusion.

**Activity:**

Instruct students to solve Q1 (a, b, c, e) of "Learning check 5.6" in their notebooks. Walk around and check their working and guide them where needed. After completing call one by one each pair to the front and ask to present their work to the whole class and explain each step of solution to the whole. Appreciate them for their best effort and discuss with them their common mistakes.

**Sum Up:** **(3 min)**

Sum up the lecture by retelling students about algebraic identity $(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$ and demonstrate how it can be used to expand expressions.

**Assessment:** **(5min)**

To assess students' learning, have them solve "Pause and try part a" at page 94 and Q1 (i, j, l) of "Learning check 5.6" on page 95 of their textbook.

**Homework:** **(2 min)**

Solve Q3, Q4 and Q6 of "Learning check 5.6" on page 95 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week: 4** **Lesson Plan: 4**

**Unit Name:** Sequence and Algebra **Topic:** Cubic Identities **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Manipulate algebraic expressions: $(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 93, 94 and 95

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(7 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work. Ask students about their homework. Ask them how can factorize the algebraic expression of the form $(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$. After taking their response write an expression $4x + 7y$ on the board and ask them to find cube of the given expression. Walk around and check their work and guide them where needed.

**Main Activities/Concept Building:** **(23 min)**

Begin the lesson by telling students today we will learn the cubic identity $(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$. Ask students: Do you know what is meant by cubic identity? Encourage students to share their ideas and explanations. Like algebraic identities the cubic identities are also true for all values of the variable. Now we will first prove the algebraic identify $(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$. Explain students first take the LHS and prove that it is equal to the right hand side. As we know that $(a + b)^3 = (a + b)(a + b)(a + b)$, now we multiply it in the same way as we multiply binomial with binomials.

$(a - b)^3 = (a - b)(a - b)^2$

$(a + b)^3 = (a - b)(a^2 - 2ab + b^2)$

$(a + b)^3 = a(a^2 - 2ab + b^2) - b(a^2 - 2ab + b^2) = a^3 - 2a^2b + ab^2 - a^2b + 2ab^2 - b^3$

$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$

Instruct students to open their textbook page 93 and prove the identity in their notebooks again. For more clarification solve the worked example 1 parts b "Find the cube of $(4p - 5q)$ by using identity." Solve the given example step by step on the board and explain each step to them.

$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$

$(4p - 5q)^3 = (4p)^3 - 3(4p)^2(5q) + 3(4p)(5q)^2 - (5q)^3$

$= 64p^3 - 3(16p^2)(5q) + 12p(25q^2) - 125q^3 = 64p^3 - 240p^2q + 300pq^2 - 125q^3$

For more explanation solve different examples on the board and encourage students to ask questions if they have any confusion.

**Activity:**

Instruct students to solve Q1 (d, f, g, h) of "Learning check 5.6" in their notebooks. Walk around and check their working and guide them where needed. After completing call one by one each pair to the front and ask to present their work to the whole class and explain each step of solution to the whole. Appreciate them for their best effort and discuss with them their common mistakes.

**Sum Up:** **(3 min)**

Sum up the lecture by retelling students about algebraic identity $(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$ and demonstrate how it can be used to expand expressions.

**Assessment:** **(5min)**

To assess students' learning, have them solve "Pause and try part b" at page 94 and Q1 (k) of "Learning check 5.6" on page 95 of their textbook.

**Homework:** **(2 min)**

Solve Q2 and Q5 of "Learning check 5.6" on page 95 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 4 **Lesson Plan:** 5

**Unit Name:** Sequence and Algebra **Topic:** Sum Up and Unit Check **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 5 by solving Q1-6 of Unit Check Exercise.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 95 and 96

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Tell students that they are going to revise all the concepts of the Unit “Sequence and Algebra”.
Ask them the different questions that are related to the unit

**Main Activities/Concept Building: (30 min)**

**Activity:**

Have students open pages 95 and 96 of their textbooks. Ask them to solve Q1 to Q4 of “Unit check 5” of their textbooks. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Sum Up: (3 min)**

Sum up the lesson by repeating the important points of unit using sum up given at page 95.

**Assessment: (0 min)**

N/A

**Homework: (2 min)**

Solve Q5-6 of “Unit check 5” given at page 96 of their textbooks.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____
_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 4 **Lesson Plan:** 6

**Unit Name:** Sequence and Algebra **Topic:** Sum up and Unit check **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 5 by solving Q7-12 of Unit Check Exercise.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 95 and 96

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Tell students that they are going to revise all the concepts of the Unit “Sequence and Algebra”.
Ask them the different questions that are related to the unit

**Main Activities/Concept Building: (30 min)**

**Activity:**

Have students open page 96 of their textbooks. Ask them to solve Q7 to Q10 of “Unit check 5” of their textbooks. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Sum Up: (3 min)**

Sum up the lesson by repeating the important points of unit using sum up given at page 95.

**Assessment: (0 min)**

N/A

**Homework: (2 min)**

Solve Q11-12 of Unit check 5 given at page 96 of their textbooks.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____
_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 4 **Lesson Plan:** 7

**Unit Name:** Sequence and Algebra **Topic:** Sum up and Unit Check **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 5 by solving Q13-15 of Unit Check Exercise and by completing "work with math" activity.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 96 and 97, Flash cards of algebraic identities, Blank papers, Scoring sheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Tell students that they are going to revise all the concepts of the Unit "Sequence and Algebra".
Ask them the different questions that are related to the unit

**Main Activities/Concept Building:** **(30 min)**

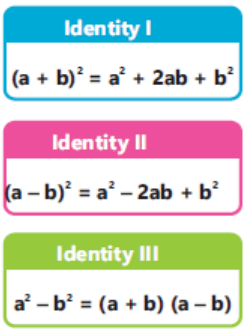
**Activity:**

Have students open pages 96 and 97 of their textbooks. Ask them to solve Q13 to 14 of "Unit check 5" of their textbooks. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Activity 2:**

**Tell students that now we are going to do an activity of 'work with math' on page 97.**

- Get students into 3 groups.
- Put the cards upside down on the table. Instruct each group to come forward and choose one card and go back to their position.
- Now instruct them to show their cards.
- Ask them to show geometric proof of these identities using chart papers.
- Each group will complete the challenge and then get it checked by the other group.
- The group with the most accurate and quick response wins.




**Sum Up:** **(3 min)**

Sum up the lesson by repeating the important points of unit using sum up.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Solve Q15 of "Unit check 5" given at page 97 of their textbooks.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 5 **Lesson Plan:** 1

**Unit Name:** Sequence and Algebra **Topic:** Revision **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Sequence and Algebra”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(3 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Ask them a few questions related to the concept of unit “Sequence and Algebra”.
Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

# Worksheet

**Name: _____** **Date: _____**

**1. Identify whether a given sequence is arithmetic or geometric?**

**a) 6, 8, 10, 12, 14, …** **b) 8, 16, 24, 32, 40, …**

**2. Find the next three terms of each sequence by using term-to-term rule?**

| | |
|---|---|
| 11, 25, 39, 53, … | 112, 108, 104, … |

**3. Find the general term for each arithmetic sequence.**

| | |
|---|---|
| a) –54, –44, –34, –24, … | b) 96, 91, 86, 81, 76, … |

**The first term of the sequence is 12 and the common difference is 9. Find the 20th and 31st term of the arithmetic sequence.**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 5 **Lesson Plan:**2

**Unit Name:** Sequence and Algebra **Topic:** Revision **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Sequence and Algebra”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(3 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Sequence and Algebra”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

# Worksheet

**Name:** _____ **Date:** _____

**2.** **Separate out the open and closed sentences.**

a) $8x + 4 = 9$ b) $4 + 16 = 100 \div 5$ c) $35 - 21 = 21 - 35$

**3.** **Identify and separate out the inequalities and given reason to yours answer?**

a) $2 + 4x = -8$ b) $5t - 5 > -4$ c) $2y2 - 3 \leq 5$

**4.** **Add the following polynomials.**

a) $4x^2 - 2x + 4, 3x^3 + 2x^2 - 5x + 7, 7x + 7$

b) $5a^4 - 5a^2 + 3a, 8a^3 - 3a + 7, 9a^2 - 2a - 9$

**5.** **Subtract the following polynomials.**

a) $3x^2 - 11x + 12 - (7x^2 + 5x + 2)$

b) $6u^5 - 4u^3 + 2u^2 - 19 - (8u^4 + 5u^3 - 2u^2 + 11)$

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 5 **Lesson Plan: 3**

**Unit Name:** Sequence and Algebra **Topic:** Revision **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Sequence and Algebra”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(3 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Sequence and Algebra”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

# Worksheet

**Name:** _____ **Date:** _____

1. **Find the product of the following.**

| a) $(3x + 4y)(7x + 9)$ | b) $(2a – 7)(7a + 9)$ |
|---|---|

2. **Divide the following.**

| a) $5x^2 + 10x – 5$ by $x + 1$ | b) $8x^4 – 2x^3 + 3x^2 – 9x – 27$ by $2x – 3$ |
|---|---|

3. **The product of two polynomials is $5a^4 + 29a^3 – 120a^2 + 108a – 432$ if one polynomial is $a – 3$ then find the other polynomial.**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 5 **Lesson Plan: 4**

**Unit Name:** Sequence and Algebra **Topic:** Revision **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Sequence and Algebra”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(3 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Ask them a few questions related to the concept of unit “Sequence and Algebra”.
Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

# Worksheet

**Name: _____** **Date: _____**

1. **Simplify the following by using the BODMAS rule.**

a) $4x + [5x^2 – \{10x^2 + 8x + 7 – (2 + 2x^2) + 8x\}]$

b) $-16\ (7\ (3x + 7) – 5(4x + 7y – 2) + 9(7y + 11x + 8)$

c) $4a – [4b^2a + 2\{2ab + a^2 + 2b(a + b)\}]$

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 5 **Lesson Plan:** 5

**Unit Name: Sequence and Algebra** **Topic:** Revision **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Sequence and Algebra”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(3 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Ask them a few questions related to the concept of unit “Sequence and Algebra”.
Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**
**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐
**Reason/Comments:**

_____
_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

# Worksheet

**Name: _____** **Date: _____**

**Evaluate the following algebraic expressions by using identities.**

**a) $(x + 4y)(x – 4y)$**

**b) $(3b + c)^2$**

**c) $57 \times 63$**

**d) $(101)^2$**

**e) If $a + b = –9$ and $a – b = 5$ then find $a^2 – b^2$.**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 5 **Lesson Plan:** 6

**Unit Name:** Sequence and Algebra **Topic:** Revision **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Sequence and Algebra”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(3 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Ask them a few questions related to the concept of unit “Sequence and Algebra”.
Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

# Worksheet

**Name: _____** **Date: _____**

**1. Factorize the following algebraic expressions.**

a) $5x^2 + 5y^2 + x^2z^2 + y^2z^2$

b) $18a^2 – 54ab + 9b^2 – 45c^2$

c) $36x^2 + 9y^2 + 36xy$

d) $25a^2 – 130ab + 169$

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 1** **Week:** 5 **Lesson Plan:** 7

**Unit Name:** Sequence and Algebra **Topic:** Revision **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Sequence and Algebra”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(3 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Sequence and Algebra”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

# Worksheet

**Name: _____** **Date: _____**

1. **Evaluate the following expressions by using algebraic identities.**

a) $(3 + 4y)^3$

b) Find the value of $a^3 – b^3$ when $a – b = – 8$ and $ab = -4$

c) Find the value of $x^3 – 1/x^3$ when $x + 1/x = 4$

d) Find the value of $(10p +15q)^3$.

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 1

**Unit Name:** Linear Equations and their Graphs **Topic:** Simultaneous Linear Equations **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Recall simultaneous linear equations in two variables and identify how to construct them.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook pages 98, 99 and 100

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(8 mins)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work. Have students open textbook at page 98. Quickly recall the concepts related to questions given in rapid recall. Then ask them to solve those questions. Read the opening page question and tell them that we will be able to solve it after learning about the concepts of the unit.

(***Note for teachers:*** *The sections "Think out of the box", "Talk over and write" and "Technology corner" are supplementary exercises. These can also be given to students who finish their work quickly or are fast learners.)*

**Main Activities/Concept Building:** **(22 min)**

Before the main concept, tell them briefly about the unit outline and its real-life relevance. Begin the lesson by asking students if they know what a simultaneous linear equation is? Allow some students to give answers or share their ideas. After taking their responses and write two linear equations on the board for example 4x + 3y = 2 an 5x + 7y = 9 on the board. and tell them that the pair of the linear equations is called the simultaneous linear equation. Explain to them, as we know that the general form of a linear equation in two variables is $ax + by = c$, where x and y are variables, a and b are non-zero coefficients, and c is the constant. Write two linear equations by using variables x and y on the board.

$$a_1x + b_1y = c_1,\ a_2x + b_2y = c_2$$

Tell students to observe the pair of the given linear equation these pair of linear equation is the simultaneous linear equation. Instruct them to open the textbook page 99 and read the statement of the worked example 1. Ask them what is given and what we have to find. Take their responses and tell them that Arslan is 4 times as old as his son. After 12 years, the sum of their ages will be 69 years and we have to construct simultaneous linear equations for the given condition. Solve this worked example step by step on the board. Encourage students to ask questions if they have any confusion. For more clarification construct different linear equations on the board step by step and explain each step to them.

**Activity:**

Instruct students to open their textbook page 100 and read the statement of the Q1 of the "Learning check 6.1" Ask them to tell what is given and what we have to find. Then Solve the question step by step on the board and explain each step to them. Ask students to solve the question again in their notebook and ask question if they have any confusion.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students about to construct the simultaneous linear equations from the given statement. Also explain the "Note to Remember" given at page 99 of their textbook.

**Assessment:** **(5 min)**

To assess students' learning, have them solve "Pause and try" at page 99.

**Homework:** **(2 min)**

Revise the classwork.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 2

**Unit Name:** Linear Equations and their Graphs **Topic:** Simultaneous Linear Equations **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Construct simultaneous linear equations in two variables.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 100, paper slips

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: what is simultaneous linear equation and how can we identify it? Take their responses and then ask students to write simultaneous linear equations in their notebooks. Walk around and check their work and guide them where required.

**Main Activities/Concept Building: (25 min)**

Tell students today we will construct the simultaneous linear equation in two variables. Instruct students to open their textbook page 100 and read the statement of the worked example 2 and tell what is given and what we have to find. Call a student to the front of the class and instruct to construct the simultaneous linear equations for the given statement. Ask the rest of the class to check whether he/she correctly write the equations for the given statement. After this discuss with them about their common mistakes. For more practice write different statement related to simultaneous linear equations on the board and instructs them to construct equations for the statements. Walk around and check their work and guide them where needed.

**Activity:**

Instruct students to work in pairs. Give each pair a paper slips a statement of written on it. Instruct them to read the statement and construct simultaneous linear equation for it. Walk around and check their working and guide them where needed. After completing call one by one each pair to the front and ask to present their work to the whole class and explain each step of solution. Repeat this activity to each pair of the class. Appreciate them for their best effort and discuss with them their common mistakes. The pair with accurate working in short time will be announced as winner.

**Sum Up: (3 min)**

Sum up the lesson by retelling students about to construct the simultaneous linear equations from the given statement.

**Assessment: (5 min)**

To assess students, ask them to solve Q2 of “Learning Check 6.1” given at page 100 of their textbook in their notebooks.

**Homework: (2 min)**

Solve Q3 of “Learning check 6.1” given at page 100 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 3

**Unit Name:** Linear Equations and their Graphs **Topic:** Solving Simultaneous Linear Equations **Date:**___

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify how to solve simultaneous linear equations in two variables using elimination method.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 100, 101 and 110

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: What is simultaneous linear equation? How we can construct a simultaneous linear equation? Take their responses and then write two pairs of equations on the board and ask students to tell which one is the simultaneous linear equations and which one is not? Appreciate the students who give the right answer.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will solve simultaneous linear equations using the elimination method. Before talking about the elimination method, ask students: What is meant by solution of a simultaneous linear equation? Take their responses and write a linear equation with two variables on the board and tell them that a linear equation in two variables is satisfied by as many values as required as we suppose value of one variable and then find the value of the other variable. Explain to them in simultaneous linear equations unique solution that is satisfied by a single pair of values of the variables involved. Tell them that solving simultaneous linear equations means finding the unique pair of values of the variables involved that satisfy both equations, and this unique pair of values of variables is known as the solution of the simultaneous linear equations. Tell students now we find the solution of the simultaneous linear equations by elimination method. Ask them: Do you know what is elimination method? Take their responses and instruct students to open their textbook page 101 and observe the simultaneous linear equations that are $4x + y = 26$, $2x - 3y = 4$ and now we have to find the values of the variables by using elimination method. Tell them that first we eliminate one of the variables in the given simultaneous linear equations x or y and get a third linear equation with only one variable. By solving we get the value of one of the variable. Now we put the value of x in any of the given equations and find the value of the variable y. Solve the example step by step on the board and explain each step to them. Encourage them to ask question if they have confusion.

$4x + 3y = 26$ —— (1) $2x - 3y = 4$ —— (2)
Add equations (1) and (2),
$(4x + 3y) + (2x - 3y) = 26 + 4$
$4x + 3y + 2x - 3y = 30$
$6x = 30$
$x = 5$

**Activity:**

Instruct students to open their textbook page 110 and read the statement of the Q1 (a) of the “Learning check 6.2” Ask them to tell what is given and what we have to find. Then Solve the question step by step on the board and explain each step to them. Ask students to solve the question again in their notebook and ask question if they have any confusion.

**Sum Up:** **(3 min)**

Sum up the lesson by explaining the “Note to Remember” given at page 100 and 101 of their textbook.

**Assessment:** **(5 min)**

To assess students, ask them to solve Q1 (b) of “Learning Check 6.2” given at page 110 of their textbook in their notebooks.

**Homework:** **(2 min)**

Solve Q1 (c-d) of “Learning check 6.2” given at page 110 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 4

**Unit Name:** Linear Equations and their Graphs **Topic:** Elimination Method **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Solve simultaneous linear equations in two variables using elimination method.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 102 and 110, Paper slips.

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: What is meant by solution of simultaneous linear equation? How we can find the solution of the simultaneous linear equations by using elimination method? Take their responses and appreciate for their correct answers.

**Main Activities/Concept Building: (25 min)**

Tell students that today we will solve simultaneous linear equations in two variables using elimination method. Instruct students to open their textbook page 102 and observe the simultaneous linear equations in given in the worked example 2. Then write the equations on the board and call a student to the front of the class and instruct to solve the simultaneous linear equations by using elimination method. Ask the rest of the class to check whether he/she correctly find the values of the variable by using elimination method. Instruct to students solve the worked example 2 in their notebooks again step by step. Walk around and check their work and guide them where needed. Discuss with them about their common mistakes. Appreciate them for their good work.

**Activity:**

Instruct students to work in pairs. Give each pair paper slips simultaneous linear equation written on it. Instruct them to observe the equations and then find the values of the values of the variable involved by using elimination method. Walk around and check their work and guide them where needed. After completing call one by one each pair to the front and ask to present their work to the whole class and explain each step of solution. When one pair presents their work, the remaining students observe their working and correct him/her if needed and ask questions if they have any confusion. Repeat this activity to each pair of the class. Appreciate them for their best effort and discuss with them their common mistakes. The pair with accurate working in short time will be announced as winner.

**Sum Up: (3 min)**

Sum up the lesson by retelling students about how to solve the simultaneous linear equations by using elimination method.

**Assessment: (5 min)**

To assess students’ learning, have them solve “Pause and try” at page 102 of their textbook in their notebooks.

**Homework: (2 min)**

Solve Q1 (e-h) of “Learning check 6.2” given at page 110 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 5

**Unit Name:** Linear Equations and their Graphs **Topic:** Substitution Method **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify how to solve simultaneous linear equations in two variables using substitution method.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 102, 103 and 110.

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: What is the elimination method of finding the values of the variable involved in the simultaneous linear equation.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will learn another method to find the solution of the simultaneous linear equations that is called substitution method. Ask students do you know about the substitution method? Take their responses and instruct to students to open their textbook page 102 and observe the worked example 1 where simultaneous linear equations are given. Tell students in elimination method we eliminate one variable and to get a third linear equation and by finding the value of the one variable we can find the value of the other variable by putting the value of one variable in any of the given equations. But in substitution method first we take any one of the given equations and find the value of one of the variables in terms of the other. Then we substitute this value for the variable in the second equation. In this way, the second equation reduces to a third equation, which is a linear equation in one variable.

In worked example 1 we take the second equation $x – y = 2$ and find the value of x in term of y that is: $x = y + 2$. Now put the value of x in the first equation $x + y = 12$. Hence, the value of one of the variables is found by solving the third equation. Finally, we substitute the value of y in the third equation to find the value of x. Solve the worked example step by step on the board.

$x + y = 12$ ---------- (1) $x – y = 2$ ---------- (2)

Form equation (2) we have $x = y + 2$

$x + y = 12 \Rightarrow (2 + y) + y = 12$

$2 + y + y = 12 \Rightarrow 2 + 2y = 12$

$2y = 12 – 2 \Rightarrow 2y = 10 \Rightarrow y = 5$

$x = y + 2 = 5 + 2 = 7$

Encourage students to ask questions if they have any confusion. For more clarification construct different linear equations on the board step by step and explain each step to them.

**Activity:**

Instruct students to open their textbook page 110 and read the statement of the Q2 (a, b) of the “Learning check 6.2” Ask them to tell what is given and what we have to find. Then solve the question step by step on the board and explain each step to them. Ask students to solve the question again in their notebook and ask question if they have any confusion.

**Sum Up:** **(3 min)**

Sum up the lesson by retelling students about to solve the simultaneous linear equations by using substitution method.

**Assessment:** **(5 min)**

To assess students’ learning ask them to tell the steps find the value of x and y by using substitution method.

**Homework:** **(2 min)**

Solve Q2(c-d) of “Learning check 6.2” given at page 110 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 6

**Unit Name:** Linear Equations and their Graphs **Topic:** Substitution Method **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Solve simultaneous linear equations in two variables using substitution method.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 103 and 110, Paper slips

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: To tell what is the difference between the elimination method and substitution method? How we can find the solution of simultaneous linear equation by using substitution method? Tell the steps of the finding the value of x and y by using substitution method? Take their responses and appreciate them for their correct answers.

**Main Activities/Concept Building: (25 min)**

Tell students that today we will solve simultaneous linear equations in two variables using substitution method. Instruct students to open their textbook page 102 and observe the simultaneous linear equations in given in the worked example 2. Then write the equations on the board and call a student to the front of the class and instruct to solve the simultaneous linear equations by using substitution method. Ask the rest of the class to check whether he/she correctly find the values of the variable by using substitution method. Instruct to students solve the worked example 2 in their notebooks again step by step. Walk around and check their work and guide them where needed. Discuss with them about their common mistakes. Appreciate them for their good work.

**Activity:**

Instruct students to work in pairs. Give each pair paper slips substitution linear equation written on it. Instruct them to observe the equations and then find the values of the values of the variable involved by using substitution method. Walk around and check their work and guide them where needed. After completing call one by one each pair to the front and ask to present their work to the whole class and explain each step of solution. When one pair presents their work, the remaining students observe their working and correct him/her if needed and ask questions if they have any confusion. Repeat this activity to each pair of the class. Appreciate them for their best effort and discuss with them their common mistakes. The pair with accurate working in short time will be announced as winner.

**Sum Up: (3 min)**

Sum up the lesson by retelling students about how to solve the simultaneous linear equations by using substitution method.

**Assessment: (5 min)**

To assess students’ learning, have them solve “Pause and try” at page 103 of their textbook in their notebooks.

**Homework: (2 min)**

Solve Q2 (e-h) of “Learning check 6.2” given at page 110 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 7

**Unit Name:** Linear Equations and their Graphs **Topic:** Graphical Method **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify how to solve simultaneous linear equations in two variables using graphical method.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 104

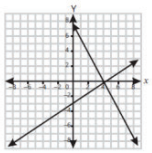
**Teaching & Learning Activities:**

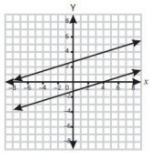
**Opening Activities/Warm-up: (8 min)**

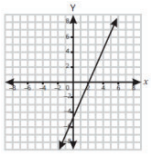
Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask them: how can we solve the simultaneous linear equations by using substitution method? Take their responses and write the pair of linear equations in two variables and call a student to the front of the class and ask him/her to find the solution of the given equations. Walk around and check their work and guide them where required.

**Main Activities/Concept Building: (25 min)**

Tell students that today we will identify another method to solve the simultaneous linear equations in two variables using graphical method. Ask them do you know how to solve the simultaneous linear equations by using graphical method? Take their responses and tell them that we can find the solution of the given equations by drawing graph and finding the common point that share the two simultaneous linear equations. Explain them that point (or points) of intersection represents the solution(s) of the given simultaneous linear equations. Tell students to find the solution of the simultaneous linear equations by using graphical method we follow some steps. Ask students to open their textbook page 104 and read the steps of finding solution of simultaneous linear equations by graphical method and then tell them that first write two simultaneous linear equations on the board and ask them to observe that equations with two variables suppose x and y, then in second step we choose any value of x or y and solve the first equation and find the value of y or x. similarly we can find some more values of x or y and get the corresponding values of y or x. In the same way, find the coordinates of at least 3 points for the second equation. Now plots the points on the graph papers and draw two lines that joins the points of both equations and the point where the two lines meet with each other will give us the solution of the given simultaneous linear equations. Tell students if two lines meet each other at one point this shows that there is only one solution for the simultaneous linear equations. If these two lines never meet each other at any point or parallel to each other then there is no solution exist.







If both equations give the same line it means that there are infinitely many solutions exist. Explain the three types by drawing graphs and showing the three situations to students and explain each step to them. Instruct students to ask questions if they have any confusion.

**Sum Up: (3 min)**

Sum up the lesson by retelling students about to graphical method and how it use to find the solution of the simultaneous linear equations.

**Assessment: (5 min)**

To assess students’ understanding ask them steps to draw a graph and how to find the solution of simultaneous linear equations.

**Homework: (2 min)**

Revise the class work.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 1

**Unit Name:** Linear Equations and their Graphs **Topic:** Graphical Method **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Solve simultaneous linear equations (with single solution) in two variables using graphical method.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 104, 105, 106 and 111

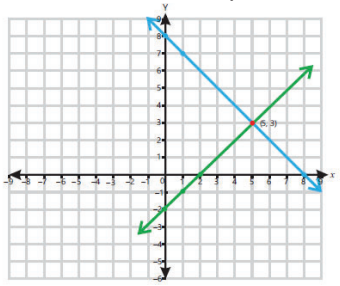
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students to tell the steps to find the solution of the simultaneous linear equations by using graphical method. Take their responses and then draw three types of graph and ask students to tell which one shows the one solution of the simultaneous linear equations. Take their responses and briefly explain each of the solution to them.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will learn how to find the solution of the simultaneous linear equations by using graphical method, when there is only one solution exist. Ask students: Do you know when one solution exists for the simultaneous linear equations? Take their responses and tell them that when the two lines meet at one point, then the point of intersection is the solution of the given simultaneous linear equations. Instruct students to open their textbook page 105 and read the statement of the worked example 1 and tell what is given and what we have to find. Take their responses and tell them that marbles that Arham and Ahad has given that is 8 and Ahad has 2 more marbles than Arham. First we have to construct simultaneous linear equations for this condition and then we have to find how many marbles each of them have. Solve the example step by step and construct the simultaneous linear equations and then find the few values of x and y for both equations. After finding the values plot the graph on the board by using the values that we get from the two equations. Instruct students to observe graph the two lines meet at point (5, 3). Explain the example step by step to them and instruct to ask questions if they have any confusion.



**Activity:**

Instruct students to open their textbook page 111 and read the statement of the Q3 (a-b) of the “Learning check 6.2” Ask them to tell what is given and what we have to find. Then solve the question step by step on the board and explain each step to them. Ask students to solve the question again in their notebook and ask question if they have any confusion.

**Sum Up:** **(3 min)**

Sum up the lesson by retelling students how to solve the simultaneous linear equation in two variables with one solution by using graphical method.

**Assessment:** **(5 min)**

To assess students, ask them to solve Q3(c) of “Learning Check 6.2” given at page 111 of their textbook in their notebooks.

**Homework:** **(2 min)**

Solve Q3 (d-h) of “Learning check 6.2” given at page 111 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 2

**Unit Name:** Linear Equations and their Graphs **Topic:** Graphical Method **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Solve simultaneous linear equations (with infinite solution) in two variables using graphical method.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook pages 107 and 108, worksheet, Paper slips

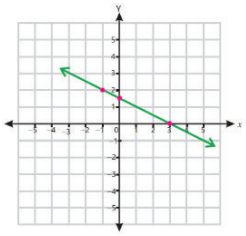
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: what is meant by single solution of simultaneous linear equation in graphical method? Take their responses and write the pair of linear equations in two variables and ask students to solve the given simultaneous linear equation in two variables and find the single point of intersection from the given pair of linear equations in two variables. Walk around and check their work and guide them where required.

**Main Activities/Concept Building:** **(30 min)**

Tell students today we will learn how to find the solution of the simultaneous linear equations by using graphical method, when there are infinite number of solution exist. Ask students: Do you know when infinite number of solution exists for the simultaneous linear equations? Take their responses and tell them that when the two equations give the same line, so there are infinitely many solutions. Instruct students to open their textbook page 107 and observe the simultaneous linear equations that are $3x + 6x = 9$ and $x + 2y = 3$. Write the equations on the board and then take first equation $3x + 6y = 9$ and find the ordered pairs satisfying the equation, first put $x = 0$ in the equation and find the value of y that $y = \frac{3}{2}$, similarly put $y = 0$ and find the value of x that is $x = 3$, find few more values for the equation $3x + 6y = 9$. So, $(0, \frac{3}{2})$, (3, 0) and (-1, 2) are the ordered pairs satisfying the equation $3x + 6y = 9$. Similarly find the ordered pair for the second equation $x + 2y = 3$ step by step and explain each step to them. So, $(0, \frac{3}{2})$, (3, 0) and (-1, 2) are the ordered pairs satisfying the equation $x + 2y = 3$. Now plot all the points from both equations on the graph on the board by using the values that we get from the two equations. Instruct students to observe graph the both lines resulted in the same straight lines. Explain each step to them and instruct to ask questions if they have any confusion.



**Activity:**

Instruct students to work in pairs. Give each pair a paper slips of simultaneous linear equations written on it. Instruct students to find the ordered pairs for the given simultaneous linear equations that satisfying the equations and then plot the graph for those points. Walk around and check their work and check their work and guide them where required. After completing work each pair one by one come to the front of the class and show and explain each step of drawing graph of simultaneous that have infinite solutions.

**Sum Up:** **(3 min)**

Sum up the lesson by retelling students how to solve the simultaneous linear equation in two variables with infinite number of solution by using graphical method.

**Assessment:** **(5 min)**

To assess students, ask them to tell the steps of drawing graph of simultaneous linear equations with infinite number of solutions.

**Homework:** **(2 min)**

Solve the worksheet.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

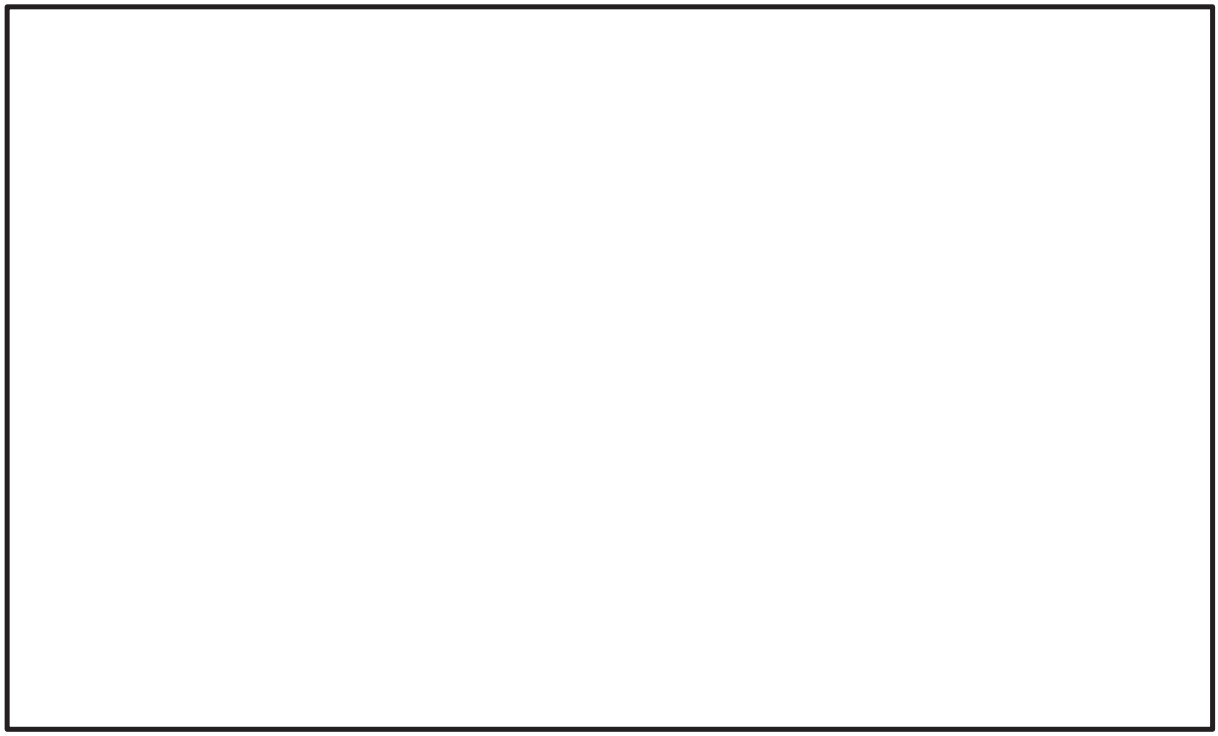
| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

# Worksheet

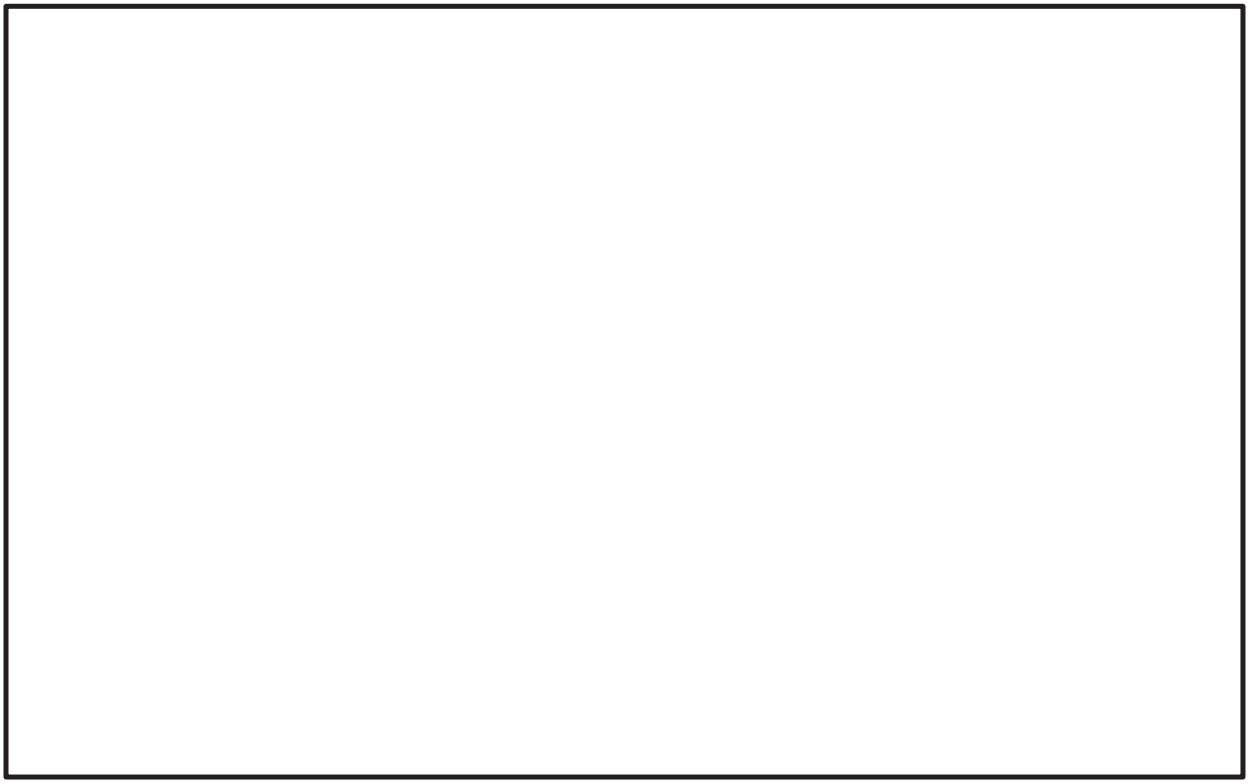
**Name: _____** **Date: _____**

1. **Solve the following system of linear equations graphically.**

   a) 2x + 5y = 4, 4x + 10y = 8



   b) $x$ **– 3y = 9, 4**$x$ **– 12y = 36**



| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 3

**Unit Name:** Linear Equations and their Graphs **Topic:** Graphical Method **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Solve simultaneous linear equations (with no solution) in two variables using graphical method.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook pages 108 and 109, worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(8 min)**

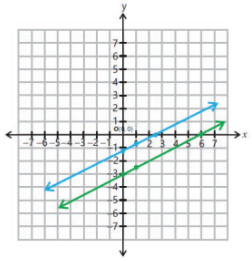
Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: what is meant by infinite solution of simultaneous linear equations in graphical method? Take their responses and write the pair of linear equations in two variables and ask them to express the infinite solution graphically. Walk around and check their work and guide them where required.

**Main Activities/Concept Building:** **(22 min)**

Tell students today we will learn how to find the solution of the simultaneous linear equations by using graphical method, when there is no solution exists. Ask students: Do you know when no solution exists for the simultaneous linear equations? Take their responses and tell them that when we plot points on the graph of two equations and the two lines are parallel to each other or never meet each other at any point then there is no solution exists. Instruct students to open their textbook page 108 and observe the simultaneous linear equations that are 2x -4y = 5 and x – 2y = 6. Write the equations on the board and then take first equation 2x – 4y = 5 and find few ordered pairs satisfying the equation. Similarly find the ordered pair for the second equation x – 2y = 6 step by step and explain each step to them. Now plot all the points from both equations on the graph on the board by using the values that we get from the two equations. Instruct students to observe graph the both lines resulted in the two parallel straight lines. Explain each step to them and instruct to ask questions if they have any confusion.

| $x$ | 0 | $\frac{5}{2}$ | 1 |
|---|---|---|---|
| y | $-\frac{5}{4}$ | 0 | $-\frac{3}{4}$ |

| $x$ | 0 | 6 | 1 |
|---|---|---|---|
| y | −3 | 0 | $-\frac{5}{2}$ |



**Activity:**

Instruct students to work in pairs. Give each pair a paper slips of simultaneous linear equations written on it. Instruct students to find the ordered pairs for the given simultaneous linear equations that satisfying the equations and then plot the graph for those points. Walk around and check their work and check their work and guide them where required. After completing work each pair one by one come to the front of the class and show and explain each step of drawing graph of simultaneous that have no solutions.

**Sum Up:** **(3 min)**

Sum up the lesson by retelling students how to solve the simultaneous linear equation in two variables with no solution by using graphical method.

**Assessment:** **(5 min)**

To assess students, ask them to tell the steps of drawing graph of simultaneous linear equations with no solutions.

**Homework:** **(2 min)**

Solve the worksheet.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

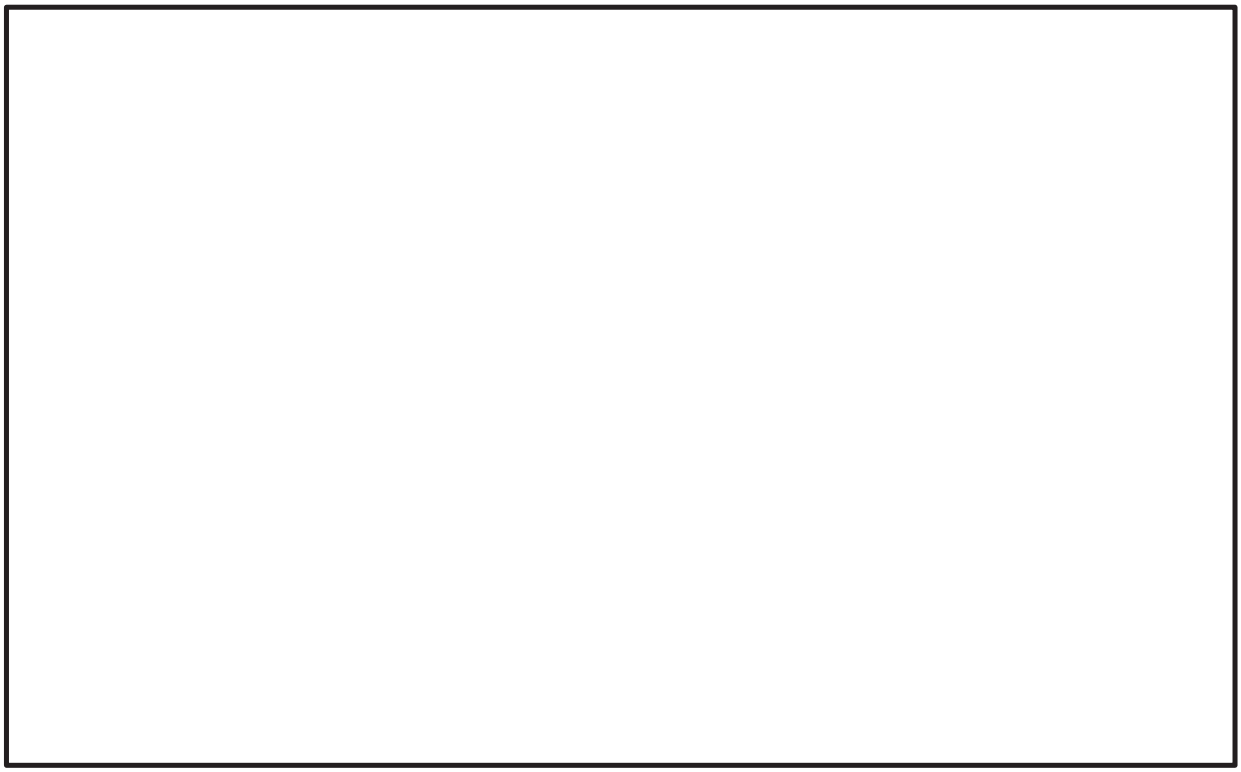
| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

## Worksheet

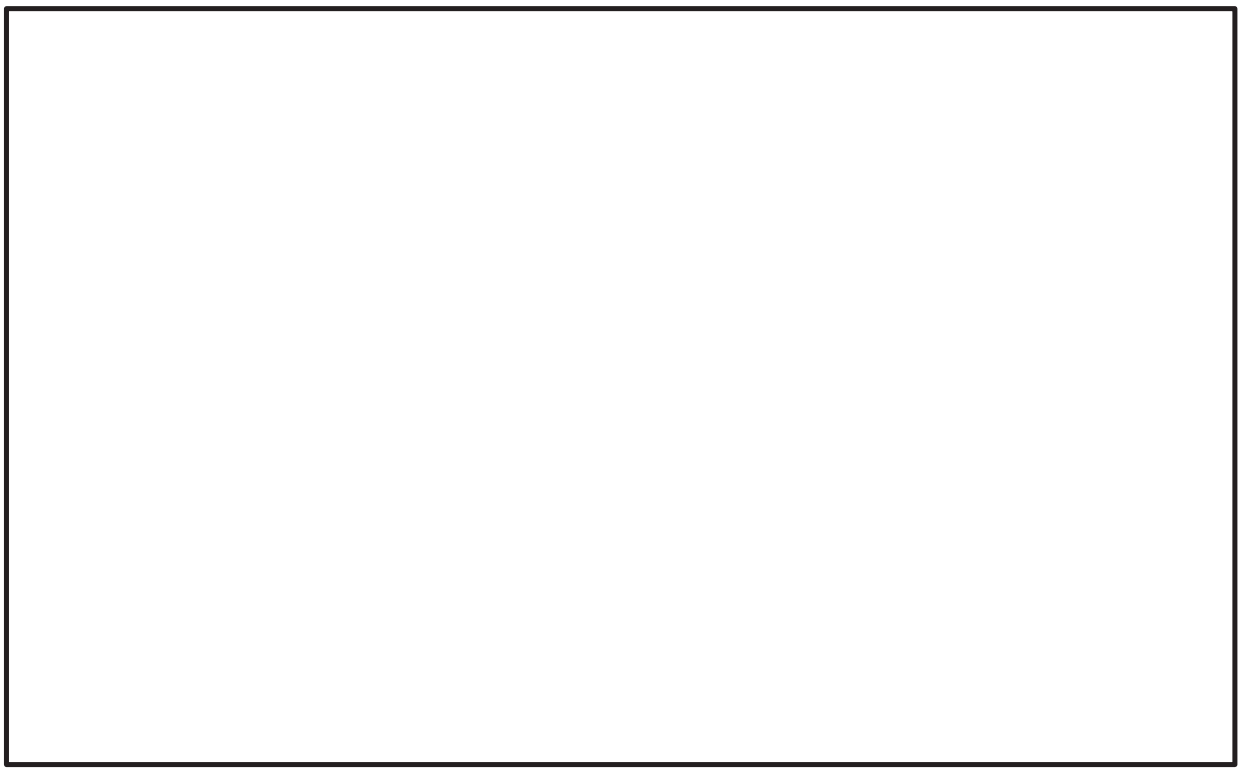
**Name: _____** **Date: _____**

1. **Solve the following system of linear equations graphically.**

   **a)** $2x - 8y = 3$ and $x - 4y = 5$



   **b) $2x + 3y = 7$ and $2x + 3y = 11$**



| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 4

**Unit Name:** Linear Equations and their Graphs **Topic:** Factorization Method **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Solve simultaneous linear equations in two variables using factorization method.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 109, 110 and 111

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students: what is meant by one solution, infinite solution and no solution of simultaneous linear equations in graphical method? Take their responses and appreciate them for their correct answer. Instruct students to write equations that show one solution, infinite solution and no solution. Walk around and check their work and guide them where needed.

**Main Activities/Concept Building: (25 min)**

Tell students that today we will learn another method to find the solution of the simultaneous linear equations that is called factorization method. Ask students do you know about the factorization method? Take their responses and instruct to students to open their textbook page 109 and observe the worked example where simultaneous linear equations are given. Tell students in factorization method we find the common factors in both equations. Write the equations on the board and given name equation 1 and equation 2. $2x + 4y = 10$ ---------- (1) and $3x + 9y = 12$ ---------- (2)

First point out towards the equation (1) $2x + 4y = 10$ and instruct students to observe it. 2 is the common factor in this equation, take 2 as common factor: $2(x + 2y) = 10$ or $x + 2y = 5$ ---------- (3)

Now point out towards the second equation $3x + 9y = 12$ and instruct students to observe and tell which is the common factor in this equation. Take their responses and tell them that 3 is the common factor in this equation. Now take 3 as a common factor as $3(x + 3y) = 12$ or $x + 3y = 4$ ---------- (4). Now subtract equation 4 from 3, we get: $x + 2y – (x + 3y) = 5 – 4$ $x + 2y – x – 3y = 1$ $–y = 1 \Rightarrow y = –1$

Now put the value of y in any of equation 3 and 4 and get the value of x.

$x + 2(–1) = 5$ or $x – 2 = 5$ or $x = 5 + 2 = 7$

Solve the worked example step by step on the board. Encourage students to ask questions if they have any confusion. For more clarification solve different linear equations on the board by using factorization method step by step and explain each step to them.

**Activity:**

Instruct students to open their textbook page 111 and read the statement of the Q4 of the "Learning check 6.2" where we have to find the solution of the simultaneous linear equations by using factorization method. Solve the question 4 part 'a' and 'b' step by step on the board and explain each step to them. Ask students to solve the question again in their notebook and ask question if they have any confusion.

**Sum Up: (3 min)**

Sum up the lesson by retelling students about to solve the simultaneous linear equations by using factorization method.

**Assessment: (5 min)**

To assess students' learning ask them to tell the steps find the value of x and y by using factorization method.

**Homework: (2 min)**

Solve Q4(c-f) of "Learning check 6.2" given at page 111 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 5

**Unit Name:** Linear Equations and their Graphs **Topic:** Real World Word Problems **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Solve real-world problems involving two simultaneous linear equations in two variables.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 111, 112 and 113

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: how can we solve the system of linear equations by using factorization method? Take their responses and write the pair of linear equations in two variables and ask them to find the solution by using factorization method. Walk around and check their work and guide them where required.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will solve real-world problems involving two simultaneous linear equations in two variables. Begin the lesson by re-telling students about the formation of linear equations and the solution of simultaneous equations. Tell students now we will learn how simultaneous linear equations in two variables can help us solve certain real-life problems. Instruct them to open their textbook page 111 and read the statement of the worked example 1. Ask them what is given and what we have to find. Take their responses and tell them that Sohail bought four chairs and a table for Rs 1800, while Ehtisham bought six chairs and two tables of the same kind for Rs 3000. We have to find the price of a chair and a table. Tell students first we construct the linear equations for the given statements.

If we suppose the price of chair ‘x’ and price of table as ‘y’, now according to the given statement we can construct the linear equations as:

(The price of 4 chairs) + (The price of 1 table) = Rs 1800

Rs 4x + Rs y = Rs 1800 $4x + y = 1800$ ---- (1)

Also, (The price of 6 chairs) + (The price of 2 tables) = Rs 3000

Rs 6x + Rs 2y = Rs 3000 $6x + 2y = 3000$ ---- (2)

Solve this example step by step on the board and explain each step to them. Encourage students to ask questions if they have any confusion. For more clarification solve worked example 2 on the board step by step and explain each step to them.

**Activity:**

Instruct students to open their textbook page 113 and read the statement of the Q1 of the “Learning check 6.3” Ask them to tell what is given and what we have to find. Then Solve the question step by step on the board and explain each step to them. Ask students to solve the question again in their notebook and ask question if they have any confusion.

**Sum Up:** **(3min)**

Sum up the lesson by summarizing the key points of the lesson. Also explain the “Note to Remember” given at page 111 of their textbook.

**Assessment:** **(5 min)**

To assess students, ask them to solve Q2 of “Learning Check 6.3” given at page 113 of their textbook in their notebooks.

**Homework:** **(2 min)**

Solve Q3 to Q6 of “Learning check 6.3” given at page 113 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 6

**Unit Name:** Linear Equations and their Graphs **Topic:** Linear Inequalities **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify and solve simple linear inequalities ax > b or cx < d or ax + b < c or ax + b > c. Represent the solution of linear inequality on the number line.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 113, 114, 115 and 116

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Write the real-life word problem on the board and call a student to the front of the class and ask him/her to construct the pair of linear equations from the given statement and then find the value of unknown values. Ask the rest of the class to check and correct if needed.

**Main Activities/Concept Building:** **(25 min)**

Tell students that today we will identify and solve simple linear inequalities and represent the solution of linear inequality on the number line. Ask them: What is meant by inequality? Take their responses and tell them that an inequality is a statement that one mathematical quantity is less than (or greater than) or less than or equal to (or greater than or equal to) another quantity. Tell students if we choose any two real numbers say a and b and compare their positions on the number line by using the relations of less than, greater than, less than or equal to, and greater than or equal to, denoted by the inequality symbols <, >, ≤ and ≥, respectively. Ask students to open their textbook page 113 and learn more about linear inequalities. Now instruct students to observe the table given at page 114 of their textbook. Explain to them when a < b means on the number line ‘a’ lies to the left of ‘b’ and if a > b it means ‘a’ lies to right of b, a ≤ b means ‘a’ coincides with ‘b’ or lies to the left of ‘b’ and a≥b means a coincide with b or lies to the right of b.

Instruct them to open their textbook page 114 and observe the linear inequality x + 1 < 4. Write the linear inequality on the board and tell them that we use the same step to solve it as we solve the linear equation. To isolate the variable on one side subtract 1 from both sides. x + 1 – 1 < 4 or x < 3. Now show the inequality on the number line. As x is less than 3, the value of x is all the numbers that are less than 3. Draw the point on the number line and explain it to students. Encourage students to ask questions if they have any confusion. For more clarification solve worked example 2 of inequality on the board step by step and explain each step to them.


**Activity:**

Instruct students to open their textbook page 116 and read the statement of the Q1 of the “Learning check 6.4” Solve Q1 part a, b and c on the board step by step and explain each step to them. Ask students to solve the question again in their notebook and ask question if they have any confusion.

**Sum Up:** **(3min)**

Sum up the lesson by retelling the definition and examples of inequality. Also explain the “Note to Remember” given at page 115 of their textbook.

**Assessment:** **(5 min)**

To assess students’ learning, have them solve “Pause and try part a and b” at page 115 in their notebooks.

**Homework:** **(2 min)**

Revise the class work.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 7

**Unit Name:** Linear Equations and their Graphs **Topic:** Linear Inequalities **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Solve simple linear inequalities and represent the solution of linear inequality on the number line.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 115 and 116, Paper slips

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: what is meant by linear inequality? How we can represent it on number line? Take their responses and then ask students if x and y are two real numbers then write the four conditions of linear inequalities. Walk around and check their work and guide then where needed.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will solve simple linear inequalities and represent the solution of linear inequality on the number line. Instruct students to open their textbook page 115 and observe the linear inequality $-3x + 1 < 7$. Ask students how we can isolate variable x on one side. Take their responses and tell them that we subtract 1 from both sides as:

$$-3x + 1 - 1 < 7 - 1 \qquad -3x < 6$$

Now we divide both sides by –3, as we divide with negative number it will change the sign of inequality and we get: $x > -2$. As $x > -2$ we can say that the solution to this inequality is all the numbers greater than -2 then show the value of x on the number line and explain it to students and instruct them to ask questions if they have any confusion. Instruct students to solve the example again in their notebooks step by step. Walk around and check their work and correct them where needed.

**Activity:**

Instruct students to work in pairs. Place the paper slips of linear inequality and instruct students to take any two paper slips of your own choice. Instruct students. Instruct them to read the statement and solve for x. Also, represent its solution on a number line. Walk around and check their working and guide them where needed. After completing call one by one each pair to the front and ask to present their work to the whole class and explain each step of solution. Repeat this activity to each pair of the class. Appreciate them for their best effort and discuss with them their common mistakes. The pair with accurate working in short time will be announced as winner.

**Sum Up:** **(3 min)**

Sum up the lesson by retelling students about key points of linear inequalities.

**Assessment:** **(5 min)**

To assess students, ask them to solve Q1 (d, e) of “Learning Check 6.4” given at page 116 of their textbook in their notebooks.

**Homework:** **(2 min)**

Solve Q1 (f, g, h) of “Learning check 6.4” given at page 116 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 3 **Lesson Plan:** 1

**Unit Name:** Linear Equations and their Graphs **Topic:** Gradient of a Straight Line **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Recognize the gradient of a straight line.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 116 and 117

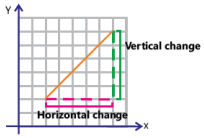
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask them: How can we draw the solution of linear inequalities on a number line. Take their responses and write a linear inequality $5x - 3 \geq 7$ on the board and call a student to the front of the class and ask him/her to solve the linear inequality for $x$ and represent it on the number line. Ask the rest of the class to check and correct it if needed.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will learn about the gradient of a straight line. Ask them: Do you know about gradient or slope of straight line? Take their responses and tell them that a gradient is simply the measure of steepness. Instruct students to open their textbook page 116 and look at the picture of boy is cycling. Instruct them to observe the steepness of the hill. Ask students in which figure riding bicycle is difficult? Take their responses and tell them that in first figure it is difficult to ride bicycle as the steepness is high in first figure than in the second figure. Tell them that when we climb up a hilly road or drive uphill, it takes much more effort than driving or walking on a straight road or downhill. Tell students that in mathematics, we define gradient (also called slope) as "the rise over run." Ask them: What is the difference between rise and run? Take their responses and tell them that the vertical change between two points is called the rise, and the horizontal change is called the run. Ask them: When will the gradient be positive or negative? Take their responses and tell them that the gradient is positive when the line moves upward from left to right and negative when it moves downward from left to right. Also, tell them that the gradient is 0 when the line is horizontal and that the gradient is undefined and can't be calculated when the line is vertical. Explain it by using figures given at page 116 of the textbooks and instruct students to ask questions if they have any confusion. Tell them to calculate the gradient of a straight line we simply calculate the ratio of the vertical change to the horizontal change, which is given below.


Gradient of a straight line = $\frac{Vertical\ change}{Horizontal\ change}$.

Explain the gradient of straight line with detail to students and by using real-life examples. Instruct them to give examples where they use gradient of the straight line. Take their responses and appreciate them for their correct answer.

**Sum Up:** **(3min)**

Sum up the lesson by retelling the definition and examples of gradient. Also explain the “Note to Remember” given at page 117 of their textbook.

**Assessment:** **(5 min)**

To assess students’ learning, ask them when gradient is positive, negative, zero and undefined.

**Homework:** **(2 min)**

Revise the class work.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 3 **Lesson Plan:** 2

**Unit Name:** Linear Equations and their Graphs **Topic:** Gradient of a Straight Line **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Interpret the gradient/slope of the straight line.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 117, Paper slips

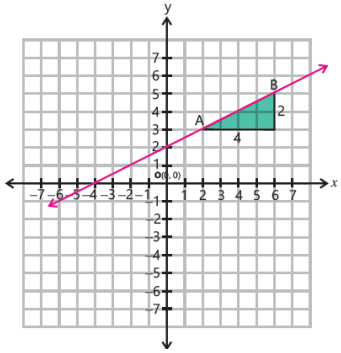
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: what is meant by gradient/slope? Differentiate between positive and negative gradient/slope. When gradient is zero? When gradient of the straight line undefined? How we can calculate the gradient of the straight line? Take their responses and appreciate them for their correct answer.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will interpret the gradient/slope of the straight line. Instruct students to open their textbook page 117 and observe the straight line that is given on graph and we have to find the gradient of that straight line. Tell students we can find the gradient of the straight line by drawing right-angled triangle between any two points on the line. As the value of gradient on a straight line is always constant so to find the gradient, choose any two points on the line and calculate the vertical and horizontal rise. We chose points A and B. Draw a right-angled triangle, so that the straight line is the hypotenuse of the triangle. Now we calculate the vertical and horizontal change. Now write the formula to find the gradient of a straight line on the board that is




$$\text{Gradient of a straight line} = \frac{\text{Vertical change}}{\text{Horizontal change}}$$

Now observe the graph, as the vertical is 2 and horizontal change is 4, put the values in the formula and find the gradient of a given straight line. Solve and find the gradient step by step on the board and explain each step to them and encourage them to ask question if they have any confusion.

**Activity:**

Instruct students to work in pairs. Give each pair a paper slip with graph of straight line. Instruct them to observe the line and find the gradient of the given straight line on the graph. Walk around and check their working and guide them where needed. After completing call one by one each pair to the front and ask to present their work to the whole class and explain each step of solution. Repeat this activity to each pair of the class. Appreciate them for their best effort and discuss with them their common mistakes. The pair with accurate working in short time will be announced as winner.

**Sum Up:** **(3 min)**

Sum up the lesson by retelling students about introduction the concept of parallel and perpendicular lines and how their slopes relate.

**Assessment:** **(5 min)**

To assess students ' understanding ask them to solve “Pause and Try” given at page 117 of their textbook.

**Homework:** **(2 min)**

Complete the given worksheet.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

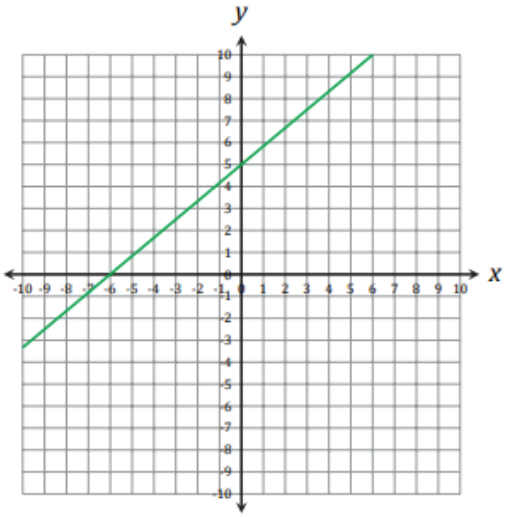
_____

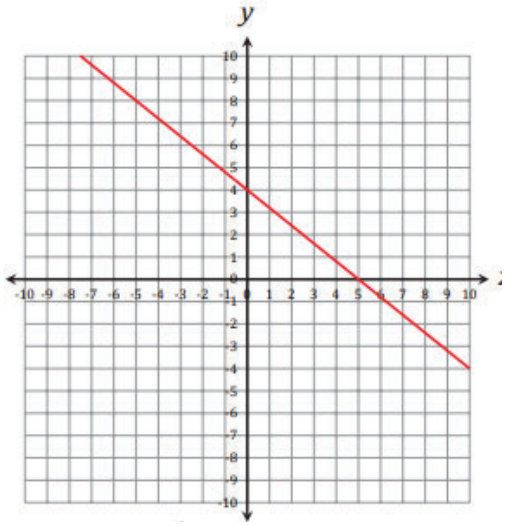
| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

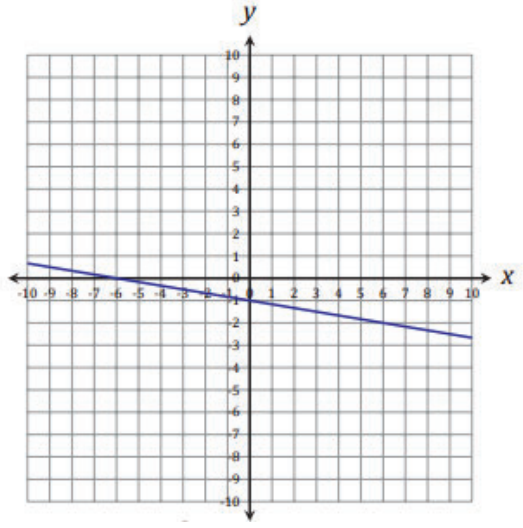
# Worksheet

**Name:** _____ **Date:** _____

**1. Find the gradient of the given straight lines.**



| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 3 **Lesson Plan:** 3

**Unit Name:** Linear Equations and their Graphs **Topic:** x and y intercepts **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Determine the intercepts of a straight line.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 118, 119 and 120, graph paper

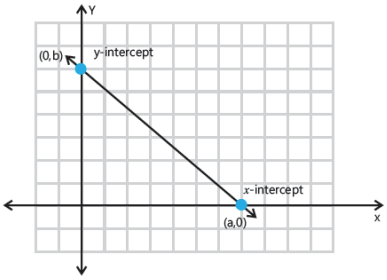
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: How we can calculate the gradient of the straight line? Write an equation of straight line on the board and ask students to draw a line for this equation by finding value of x and y and then find the gradient of the straight line? Walk around and check their work, guide and correct them where needed.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will learn about x and y intercepts. Ask students: Do you know what is meant by x and y intercept? Take their responses and paste a graph paper on the board and draw a line on the graph paper as given in the textbook page 118. Now point out towards the line and tell them that points where the line intersects the coordinate axes are called intercepts. Now point out towards he x-axis and tell them the x-coordinate of the point (a, 0) at which the graph intersects the x-axis is called the x-intercept, then point out towards the y-axis tell them y-coordinate b of the point (0, b) at which the graph intersects the y-axis is called the y-intercept. Now ask students to read the worked example 1 where we have to find the x and y- intercepts of $2x – y = –2$. First we draw a graph and then we have to find the x and y intercepts. Solve the example step by step on the board and explain each step to them. Encourage them to ask questions if they have any confusion. For more explanation solve the worked example 2 and 3 on the board and explain each step to them.




Activity:

Instruct students to open their textbook page 120. Ask them to read the statement of the Q1 of “Learning check 6.5”. Tell them that we have to find the gradient of the straight line and also find the y-intercept. Call a student to the front of the class and draw Q1 (a) on the board and ask him/her to find the gradient of the straight line given and also find the y-intercept. Instruct the rest of the class to check and correct if required. Ask students to solve again the ‘part a’ of Q1 in their notebooks. Walk around and check their work and guide them where needed. Appreciate them for their active participation.

**Sum Up:** **(3min)**

Sum up the lesson by re-telling students about how to find the x and y intercept of the gradient of the straight line.

**Assessment:** **(5 min)**

To assess students’ learning, have them solve “Pause and try” at page 119 of their textbook in their notebooks.

**Homework:** **(2 min)**

Solve Q1(b, c, d) of “Learning check 6.5” given at page 120 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 3 **Lesson Plan:** 4

**Unit Name:** Linear Equations and their Graphs **Topic:** Equation of Horizontal and Vertical Lines **Date**: ___

**Objective(s):**

**At the end of this period, the students will be able to:**

Recall the equation of horizontal and vertical lines.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 119, 120 and 121

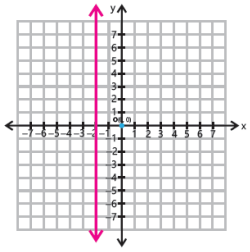
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

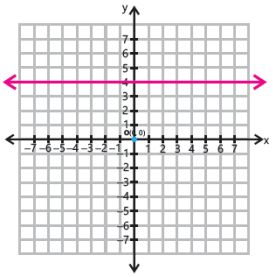
Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students: how can we find the x- and y- intercepts from the given linear equations. Take their responses and write an equation $3x - y = 8$ on the board and call a student to the front of the class and ask him/her to find x- and y- intercepts. Walk around and check their work and guide them where required.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will recall the concept of equation of horizontal and vertical lines. Ask them: Do you know about the equation of horizontal and vertical lines? Take their responses and tell them that when the value of x is constant and the value of y is changing, we get the equation of vertical line. Ask students to open their textbook page 119 and observe the graph. Tell them that as the value of x is -2 and the value of y is changing so this is the vertical line. In general we can say that when x = a where is constant value then we get the vertical line.



Tell students in the same way when the value of 'y' is constant and the value of 'x' is changing and then we get the equation of horizontal line. Ask students to open their textbook page 120 and observe the graph where the value of y = 4 is constant and the value of x is changing. In general we can say that when the value of y = b, where b is any constant is the equation of horizontal line.
Explain the concept of horizontal and vertical lines by giving different examples.



**Activity:**

Place cards of graphs of horizontal and vertical lines on the table. Call a student to the front of the class and instruct him/her to choose two cards one of horizontal line and the second one is of vertical line graph. After selecting instruct him/her to write the equation of horizontal and vertical line for the given lines. Ask the rest of the class to check and correct if needed. Appreciate him/her for their good work. Repeat this activity to each student of the class.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students about x and y-intercepts and how to find the value. Explain "Note to Remember" given at page 119 of their textbook.

**Assessment:** **(5 min)**

To assess students' learning, have them solve to Q2 (a-d) of "Learning check 6.5" given at page 121.

**Homework:** **(2 min)**

Solve Q2 (e-h) of "Learning check 6.5" given at page 121 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 3 **Lesson Plan:** 5

**Unit Name:** Linear Equations and their Graphs **Topic:** Graph of y = mx **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify how to plot graphs of linear equations in two variables i.e., y = mx.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 121, 122, 124 and 125

**Teaching & Learning Activities:**

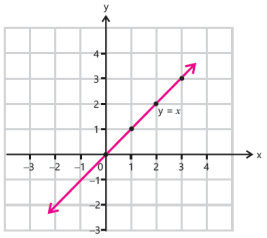
**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students: what is the general form of a horizontal and vertical lines of equations. Take their responses and write two equations x = 7 and y = – 1 on the board and ask them to identify horizontal and vertical line of equation. Take their responses and appreciate them for their correct answer. Repeat this activity by drawing different horizontal and vertical line graphs and instruct students identify the graphs of vertical and horizontal lines.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will learn to identify how to plot graphs of linear equations in form of y = mx in two variables. Ask students: Do you know about how to plot the graph of the linear equation in two variables? Take their responses and tell them that to plot the graph first we have to find the value of x and y. Instruct students to open their textbook page 121 and tell them that we have to plot a graph for the equation y = x. For this equation we put any value of x and find the value of y or we put the value of y and find the value of x.

| $x$ | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| y | 0 | 1 | 2 | 3 |




Now plot these points on the graph paper and explain each step of plotting these points to students. Now point out towards the straight lines and tell them that this is the straight line of equation y = x that passes through origin. Encourage students to ask questions if they have any confusion. For more clarification solve one example related to it on the board step by step and explain each step to them.

**Activity:**

Instruct students to open their textbook page 125. Write part a and b of the Q2 of "Learning check 6.6" on the board. Ask students: How we draw graphs for the given linear equations? Take their responses and then solve the question step by step on the board and explain each step to them. Instruct students to ask questions if they have any confusion.

**Sum Up:** **(3min)**

Sum up the lesson by recalling with students how to plot the graph of the linear equation in two variable of the form y = mx. Also explain "Note to Remember" given at page 122 of their textbook.

**Assessment:** **(5 min)**

To assess students' learning, ask them to tell the step to plot the graph of the linear equation of the form y = mx.

**Homework:** **(2 min)**

Revise the classwork.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 3 **Lesson Plan:** 6

**Unit Name:** Linear Equations and Their Graphs **Topic:** Graph of y = mx **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Plot graphs of linear equations in two variables i.e., y = mx.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 122 and 125

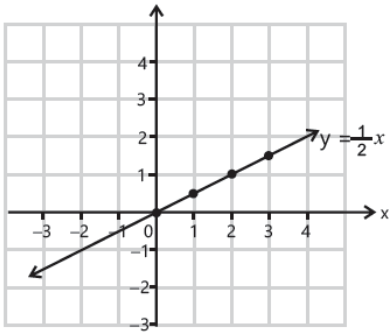
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students: how can we identify the linear equation in two variables. Take their responses and write an equation y = $\frac{2}{5}x$ on the board and call a student to the front of the class and ask him/her to draw a table for the value of x and y. Walk around and check their work and guide them where required.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will plot graphs of linear equations in two variables i.e., y = mx. Instruct students to open their textbook page 122 and read the statement of the worked example 2 and tell what is given and what we have to find. Call a student to the front of the class and instruct to draw a graph for the given equation y = $\frac{1}{2}x$. Ask the rest of the class to check whether he/she correctly draw the graph for the given statement. After this discuss with them about their common mistakes. For more practice write different examples of the linear equations in the form of y = mx on the board and instructs them to draw graphs for the statements. Walk around and check their work and guide them where needed.




**Activity:**

Instruct students to work in pairs. Give each pair paper slip a statement of written on it. Instruct them to read the statement and draw graphs for it. Walk around and check their working and guide them where needed. After completing call one by one each pair to the front and ask to present their work to the whole class and explain each step of solution. Repeat this activity to each pair of the class. Appreciate them for their best effort and discuss with them their common mistakes. The pair with accurate working in short time will be announced as winner.

**Sum Up:** **(3 min)**

Sum up the lesson by retelling students about the steps to draw a graph of the linear equation of the form y = mx.

**Assessment:** **(8 min)**

To assess students, ask them to solve Q2 (c, d, e) of "Learning Check 6.6" given at page 125 of their textbook in their notebooks.

**Homework:** **(2 min)**

Solve Q2 (f, g, h) of "Learning check 6.6" given at page 125 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 3 **Lesson Plan:** 7

**Unit Name:** Linear Equations and Their Graphs **Topic:** Graph of y = mx + c **Date:**____

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify how to plot graphs of linear equations in two variables i.e., y = mx + c.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 122, 123, 124 and 125

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(8 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students: Plot the graph for the equation x – 3y = 0. Take their responses and appreciate their work. Walk around and check their work and guide them where required.

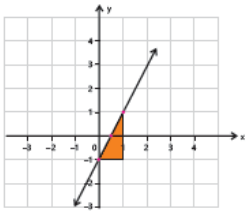
**Main Activities/Concept Building:** **(22 min)**

Tell students today we will learn to identify how to plot graphs of linear equations in form of y = mx + c in two variables. Ask students: Do you know about how to plot the graph of the linear equation in two variables? Take their responses and tell them that to plot the graph first we have to find the value of x and y. Tell them that the standard form of a linear equation in two variables is y= mx + c, m represents the gradient (or slope), and c represents the y-intercept of the line.

| $x$ | 0 | $\frac{1}{2}$ | 1 |
|---|---|---|---|
| $y$ | –1 | 0 | 1 |

Instruct students to open their textbook page 122 and tell them that we have to plot a graph for the equation y = 2x – 1 in the worked example 1. For this equation we put any value x and find the value of y or we put the value of y and find the value of x.

Now plot these points on the graph paper and explain each step of plotting these points to students. Now point out towards the straight lines and tell them that this is the straight line of equation y = 2x – 1. Instruct students to observe the triangle on the graph paper. Tell them that we can calculate the gradient by dividing the vertical change with horizontal change. Now find the y-intercept. When x = 0, the value of y is -1. This line cuts the y-axis at y = -1. So, the y intercept is -1. Observe the equation again. y = 2x +(-1). We can see that in this form, 2 is representing the gradient (slope) and -1 is representing the y-intercept of the straight line. Encourage students to ask questions if they have any confusion.



**Activity:**

Instruct students to open their textbook page 125. Write part a and b of the Q3 of "Learning check 6.6" on the board. Ask students: How we draw graphs for the given linear equations? Take their responses and then solve the question step by step on the board and explain each step to them. Instruct students to ask questions if they have any confusion.

**Sum Up:** **(3min)**

Sum up the lesson by re-telling students about gradient and y-intercept and how to plot the graph of the equation y = mx + c. Also explain the "Note to Remember" given at page 123 of their textbook.

**Assessment:** **(5 min)**

To assess students' learning, have them solve "Pause and try" at page 124.

**Homework:** **(2 min)**

Revise the class work.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 1

**Unit Name:** Linear Equations and Their Graphs **Topic:** Graph of y = mx + c **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Plot graphs of linear equations in two variables i.e., y = mx + c.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 123, 124 and 125, Paper slips

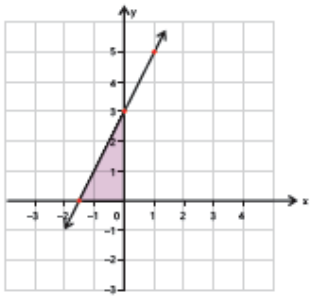
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: How we plot graph of the linear equation of the form y= mx + c? What are steps to plot the graph of the linear equation of the form y = mx + c? Take their responses and briefly explain to them about this.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will plot graphs of linear equations in two variables i.e., y = mx + c. Instruct students to open their textbook page 123 and read the statement of the worked example 2 and tell what is given and what we have to find. Call a student to the front of the class and instruct to draw a graph for the given equation y = 2x + 3. Ask the rest of the class to check whether he/she correctly draw the graph for the given statement. After this discuss with them about their common mistakes. For more practice write different examples of the linear equations in the form of y = mx + c on the board and instructs them to draw graphs for the statements. Walk around and check their work and guide them where needed.



**Activity:**

Instruct students to work in pairs. Give each pair a paper slips a statement of written on it. Instruct them to write the linear equations in two variables with constant term and draw graphs for it. Walk around and check their working and guide them where needed. After completing call one by one each pair to the front and ask to present their work to the whole class and explain each step of solution. Repeat this activity to each pair of the class. Appreciate them for their best effort and discuss with them their common mistakes. The pair with accurate working in short time will be announced as winner.

**Sum Up:** **(3 min)**

Sum up the lesson by reviewing the key concepts of linear equations, slopes, and y-intercepts.

**Assessment:** **(5 min)**

To assess students, ask them to solve Q3 (c, d) of “Learning Check 6.6” given at page 125 of their textbook in their notebooks.

**Homework:** **(2 min)**

Solve Q1 and Q3 (e, f) of “Learning check 6.6” given at page 124 and 125 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 2

**Unit Name:** Linear Equations and Their Graphs **Topic:** Gradient and y-intercept form of y = mx + c **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify the gradient and y-intercept from the equation y = mx + c.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 123 and 125, Graph Paper

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Call a student to the front of the class and write equation of linear equation in two variable for example y = 3x + 5 and instruct him/her to find the value of x for few value of y. Then call another student to front of the class and ask him/her to plot the graph for this. Ask the rest of the class to check and correct if required.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will identify the gradient and y-intercept from the equation y= mx + c. Ask students: Do you know about the y-intercept and the gradient of the straight line? Take their responses and then write the equation y = mx + c on the board and tell them that in this equation m is the gradient and or slope and c represent the y-intercept of the line. Tell them that to find the gradient we have to divide the vertical change in the graph of the linear equation with the horizontal change.

Gradient = $\frac{vertical\ change}{horizontal\ change}$

Ask students to open their textbook page 123 and observe the worked example and explain the students how to find the value of the gradient and y-intercept for the given equation. Encourage students to ask questions if they have any confusion. For more clarification solve different examples on the board.

**Activity:**

Draw a simple graph on the board with a linear equation, for example, y = 2x + 3. Ask students to identify the gradient and the y-intercept from the graph. Discuss how the slope determines the steepness of the line, and the y-intercept is the point where the line crosses the y-axis. Draw the graph for the given equation and then find the gradient and y-intercept and explain each step to them and encourage them to ask questions if they have any confusion.

**Sum Up:** **(3 min)**

Sum up the lesson by re-calling with students about the gradient and y-intercept and how to find it.

**Assessment:** **(5 min)**

To assess students, ask them to solve Q4 (a, b, c) of “Learning Check 6.6” given at page 125 of their textbook in their notebooks.

**Homework:** **(2 min)**

Solve Q4 (d, e, f) of “Learning check 6.6” given at page 125 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 3

**Unit Name:** Linear Equations and Their Graphs **Topic:** Slope-intercept form **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Find the equation in slope intercept form if gradient and y-intercept is given.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 125

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Write a linear equation in two variables, say $2x + y = 6$, and then ask students to find the gradient and y-intercept from the given equation. Take their response and appreciate their work. Walk around and check their work and guide them where required.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will find the equation in slope intercept form if gradient and y-intercept is given. Instruct students to open their textbook page 125 and read the statement of the Q5 (a) and tell what is given and what we have to find. Ask students do you know how we find the slop intercept form for the given values? Take their responses and tell them that the equation of the straight line is $y = mx + c$. put the value of m or gradient and the value of c or y-intercept in the equation of the straight line get the slop intercept form of equation of straight line. Solve the given question step by step and find the equation of slope intercept form. For more practice write Q5 (b, c) on the board and solve it step by step. Walk around and check their work and guide them where needed.

**Activity:**

Get students into pair and give each pair some paper cards of the linear equation in two variables. Instruct students to plot the graph for the given equations. After plotting the graph find the gradient and y-intercept. Walk around and check their work and guide them if needed. After completing the task each pair come forward and show their working to the whole class and explain each step to them. Appreciate them for their good work and discuss with them about their common mistakes.

**Sum Up:** **(3 min)**

Sum up the lesson by re-telling students about gradient and y-intercept and how to find it.

**Assessment:** **(5 min)**

To assess students, ask them to solve Q5 (f) of “Learning Check 6.6” given at page 125 of their textbook in their notebooks.

**Homework:** **(2 min)**

Revise the class work.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 4

**Unit Name:** Linear Equations and Their Graphs **Topic:** Sum up and Unit Check **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 6 by solving Q1-4 of Unit Check Exercise.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook pages 125 and 126

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Tell students that they are going to revise all the concepts of the Unit “Linear Equations and Their Graphs”.

Ask them the different questions that are related to the unit

**Main Activities/Concept Building: (30 min)**

**Activity:**

Have students open pages 125 and 126 of their textbooks. Ask them to solve Q1 to Q3 of “Unit check 6” of their textbooks. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Sum Up: (3 min)**

Sum up the lesson by repeating the important points of unit using sum up given at page 125.

**Assessment: (0 min)**

N/A

**Homework: (2 min)**

Solve Q4 of “Unit check 6” given at page 126 of their textbooks.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 5

**Unit Name:** Linear Equations and Their Graphs **Topic:** Sum up and Unit Check **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 6 by solving Q5-8 of Unit Check Exercise.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook pages 125 and 126

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Tell students that they are going to revise all the concepts of the Unit “Linear Equations and Their Graphs”.

Ask them the different questions that are related to the unit

**Main Activities/Concept Building: (30 min)**

**Activity:**

Have students open page 126 of their textbooks. Ask them to solve Q5 to Q7 of “Unit check 6” of their textbooks. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Sum Up: (3 min)**

Sum up the lesson by repeating the important points of unit using sum up given at page 125.

**Assessment: (0 min)**

N/A

**Homework: (2 min)**

Solve Q8 of Unit check 6 given at page 126 of their textbooks.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 6

**Unit Name:** Linear Equations and Their Graphs **Topic:** Sum up and Unit Check **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 6 by solving Q9 of Unit Check Exercise and by completing "work with math" activity.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 127, Equation cards, Boxes with labels, Graph Papers.

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Tell students that they are going to revise all the concepts of the Unit "Linear Equations and Their Graphs".
Ask them the different questions that are related to the unit

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Have students open pages 127 of their textbooks. Ask them to solve Q9(a) of "Unit check 6" of their textbooks. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Activity 2:**

Tell students that now we are going to do an activity of 'work with math' on page 127.

- Get students into 3 groups.
- Put multiple equation cards upside down on the table. Instruct each having 2 simultaneous linear equations (including the ones having no solution, infinite solutions and unique solutions).
- Now instruct them to show their cards.
- Ask them to show each pair will graph the equations and check if they have a unique solution or not. Then they will put the card in the relevant box.
- Each group will complete the challenge and then get it checked by the other group.
- The group with the most accurate and quick response wins.

**Sum Up:** **(3 min)**

Sum up the lesson by repeating the important points of unit using sum up.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Solve Q9(b) of Unit check 6 given at page 127 of their textbooks

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 7

**Unit Name:** Geometry **Topic:** Rotation **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Recall the rotation of objects and how to rotate object on coordinate plane.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook pages 128-130

**Teaching & Learning Activities:**

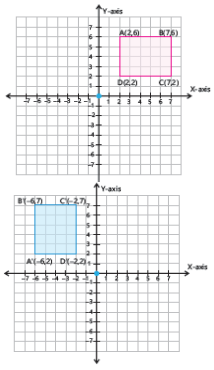
**Opening Activities/Warm-up:** **(8 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask the students: How are you? Encourage them to say, “Alhamdulillah”. Start with ‘Bismillah’ and tell them to recite it before starting any work. Begin the lesson by asking students about their homework. Have students open textbook at page 128. Quickly recall the concepts related to questions given in rapid recall. Then ask them to solve those questions. Read the opening page question and tell them that we will be able to solve it after learning about the concepts of the unit.

(***Note for teachers:*** *The sections “Think out of the box”, “Talk over and write” and “Technology corner” are supplementary exercises. These can also be given to students who finish their work quickly or are fast learners.)*

**Main Activities/Concept Building:** **(22 min)**

Before the main concept, tell them briefly about the unit outline and its real-life relevance. Tell students today that we will recall the rotation of objects and how to rotate object on coordinate plane. Begin the lesson by asking students if they know what a rotation in geometry is? Allow some students to give answers or share their ideas. After taking their responses, tell them that rotation is a type of transformation that means turning a shape around a fixed point, called the center of rotation. Tell them that the angle of rotation determines how much the object is turned. Explain them it is measured in degrees, with a positive angle indicating anti-clockwise rotation, and a negative angle indicating a clockwise rotation. Explain them there are the following steps to rotate the images as follows: In step I, identify the coordinates of the vertices of the given shape. In step II, figure out the coordinates of the points at which it will be reflected. In step III, mark the coordinates that will be the vertices of the reflected object/image. In step IV, join the vertices. The object/image thus formed will be the reflected object/image of the original object/image. Instruct them to open the textbook page 129 and rotate the given image ABCD through $90^0$ anticlockwise about the origin. Tell students first we identify the coordinates of the vertices of the given rectangle ABCD. To rotate the rectangle ABCD about the origin 90° anticlockwise, we would follow the rule (x, y)→ (-y, x), where the y-value of the original point becomes the new x-value with the opposite sign and the x-value of the original point becomes the new y-value. To rotate the image applies the roles to the vertices to create the new rectangle A’B’C’D’. After creating the new vertices of the rectangle mark the points on the coordinate plane and reflect the image. Solve this worked example by following the describe steps and explain each step to them. Encourage students to ask questions if they have any confusion. For more clarification draw different images on the board step by step and explain each step to them.




**Sum Up:** **(3min)**

Sum up the lesson by retelling students about definition and examples of rotation of different images. Also explain the “Note to Remember” given at page 129 of their textbook.

**Assessment:** **(5 min)**

To assess students, ask them to tell the steps to rotate an object on the coordinate plan.

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 5 **Lesson Plan:** 1

**Unit Name:** Geometry **Topic:** Rotation **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Rotate objects on coordinate plane.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 131, Graph paper

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students: what is meant by rotation of an image? How we can rotate an image on the coordinate plane? Take their responses and then explain the steps to rotate an image on the coordinate plane.

**Main Activities/Concept Building: (25 min)**

Tell students today we will rotate objects on coordinate plane. Instruct students to open their textbook page 131 and read the statement of the Q2 and tell what is given and what we have to find. Take their responses and tell them that first we draw a kite on the coordinate plane and then rotate it through $180^{o}$ clockwise about the origin. Give coordinate plane to each student and instruct to draw a kite and then rotate it $180^{o}$ clockwise about the origin. Walk around and check their work and guide them where required. After completing task call one by one each student to the front of the class and ask them to present their work to the whole class and explain each step. Appreciate them for their good work and discuss with them about their common mistakes.

**Activity:**

Instruct students to work in pairs. Distribute graph paper to each student. Provide students with geometric shapes like triangles, squares, rectangles and ask them to choose one shape to work with. Rotate the shape by a specific given angle and plot the new coordinates. Repeat this activity to each pair of the class. Appreciate them for their best effort and discuss with them their common mistakes. The pair with accurate working in short time will be announced as winner.

**Sum Up: (3 min)**

Sum up the lesson by explaining students how to rotate an object on the coordinate plane by explaining the steps of rotation.

**Assessment: (5 min)**

To assess students ask them to solve Q3 (a, b) of "Learning check 7.1" given at page 131 in their notebooks.

**Homework: (2 min)**

Solve Q3(c) and Q4 of "Learning check 7.1" given at page 131 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 5 **Lesson Plan:** 2

**Unit Name:** Geometry **Topic:** Finding the Centre of Rotation **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Define the centre of rotation and identify how to find the centre of rotation by construction.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook pages 130 and 131

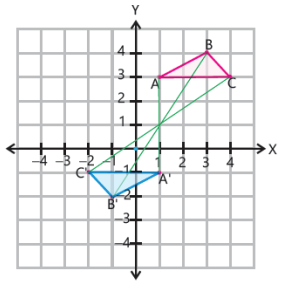
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(8 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: When we rotate an image $90^o$ anticlockwise or $270^o$ clockwise about the origin then what is the value of x and y after rotating? When we rotate an image $180^o$ anticlockwise about the origin then what are the value of x and y after rotating? When we rotate an image $270^o$ anticlockwise or $90^o$ clockwise about the origin then what are the value of x and y after rotating? Take their responses and appreciate them for their correct answer.

**Main Activities/Concept Building:** **(22 min)**

Tell students today that we will define the centre of rotation and identify how to find the centre of rotation by construction. Begin the lesson by asking students if they know what a centre of rotation of an image is? Allow some students to give answers or share their ideas. After taking their responses, tell them that the point around which a shape rotates is called the centre of rotation. Give the different examples of centre of rotation like the centre of a wheel, a fan, a Ferris, a spinner, etc. Instruct them to open the textbook page 130 and find the centre of rotation for the rotated image A’B’C’ of triangle ABC given in the worked example . Solve this worked example step by step on the board. Encourage students to ask questions if they have any confusion. For more clarification draw different objects and their images on the board and find the centre of rotation.




**Activity:**

Instruct students to open their textbook page 131 and read the statement of the Q5. Ask students to tell what are given and what we have to find. Take their responses and tell them that shapes and their images are given on the Cartesian plane and we have to find the centre of rotation. Paste the Cartesian plane on the board and copy the shape as given on the Q5 part b and then find the centre of rotation of the rectangle and explain each step to them and instruct to ask questions where they find difficulty.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students about definition and examples of centre of rotation of different images.

**Assessment:** **(5 min)**

To assess students, understanding through class participation, their ability to correctly identify the center of rotation for various shapes.

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 5 **Lesson Plan:** 3

**Unit Name:** Geometry **Topic:** Centre of Rotation **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Find the centre of rotation by construction.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 131, Graph paper

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: what is meant by centre rotation of an image? Take their responses and appreciate them for their best effort and discuss with them their common mistakes. Walk around and check their work and guide them where required.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will find the centre of rotation by construction. Instruct students to open their textbook page 131 and read the statement of the Q5 and tell what is given and what we have to find. Call a student to the front of the class and instruct to find the centre of rotation by construction of part a of Q5. Ask the rest of the class to check whether he/she correctly find the centre of rotation. After this discuss with them about their common mistakes. Give each student Cartesian plane and instruct to copy the shape given Q5 (a) again on the plane and find the centre of rotation. Walk around and check their work and guide them where needed.

**Activity:**

Instruct students to work in pairs. Place Cartesian plane with shapes and their images drawn on it on the table. Instruct students to choose one Cartesian plane and then find centre of rotation. Walk around and check their work. After completing the task instruct to share their working with each other and discuss with each other the steps to find the centre of rotation. Appreciate them for their best effort and discuss with them their common mistakes. The pair with accurate working in short time will be announced as winner.

**Sum Up:** **(3 min)**

Sum up the lesson by explaining students the steps to find the centre of rotation.

**Assessment:** **(5 min)**

Assess students ' understanding through class participation and completion of practice problems.

**Homework:** **(2 min)**

Solve Q5 (c, d) of “Learning check 7.1” given at page 131 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 5 **Lesson Plan:** 4

**Unit Name:** Linear Equations and Their Graphs **Topic:** Revision **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Linear Equations and Their Graphs”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Linear Equations and Their Graphs”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(32 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

# Worksheet

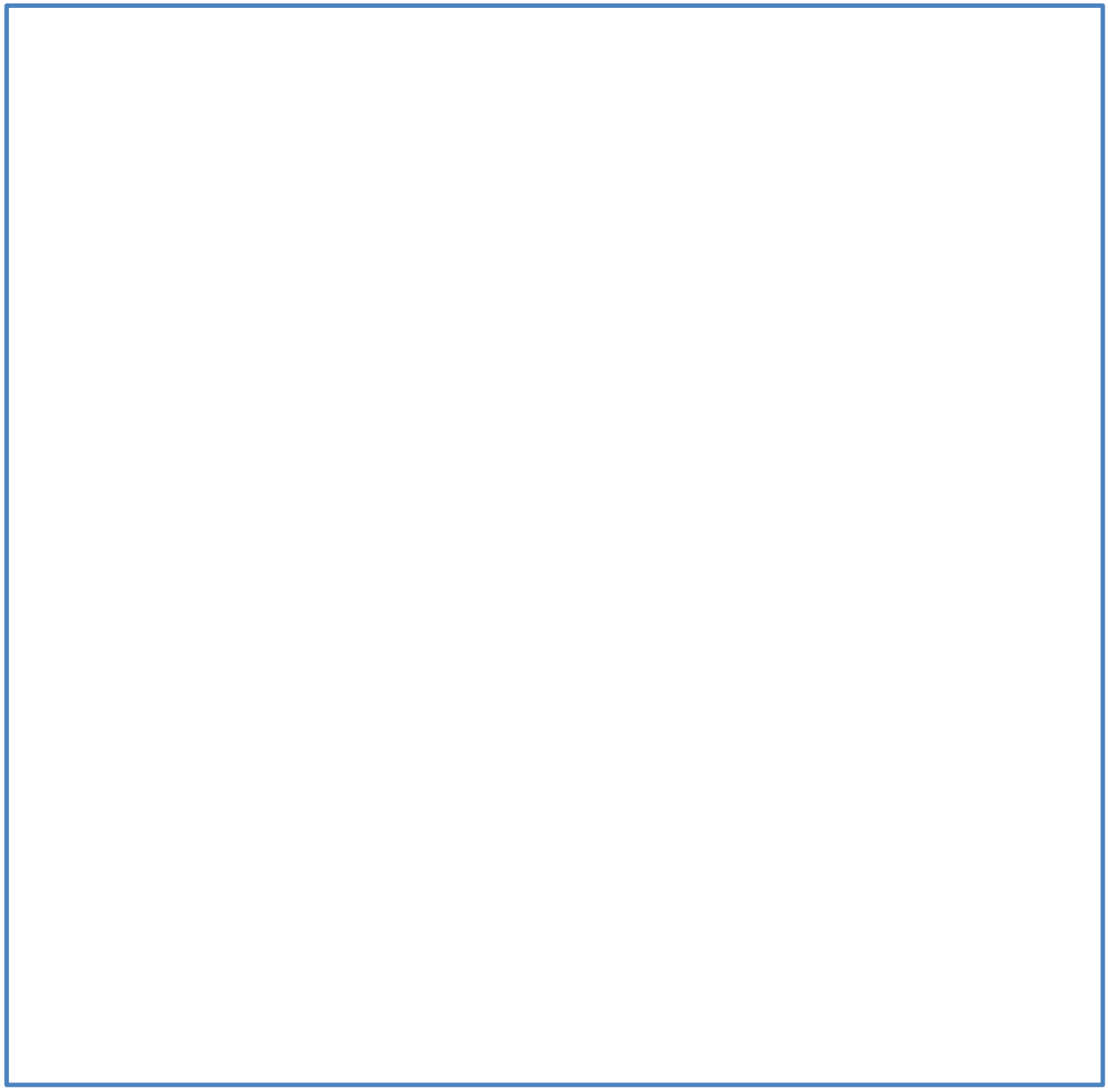
**Name: _____** **Date: _____**

1. **The cost of a key book is two times the cost of a textbook. The cost of 2 key books and 5 textbooks is Rs. 2007. Construct simultaneous linear equations in two variables for these conditions.**

2. **Solve the simultaneous linear equations x + y = 2 and x – y = 8 by using the elimination method.**

3. **Solve the simultaneous linear equations x – 2y = 13 and 2x + y = 6 by using the substitution method.**

**4. Solve the simultaneous linear equations 3x + 12y = 2 and x + 4y = 9 by using the graphical method.**



| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 5 **Lesson Plan:** 5

**Unit Name:** Linear Equations and Their Graphs **Topic:** Revision **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Linear Equations and Their Graphs”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Linear Equations and Their Graphs”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(32 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(3 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

# Worksheet

**Name: _____** **Date: _____**

1. **The sum of two number s is 20 and their difference is 6. Find the numbers.**

2. **Zara's age is 3 times her daughter's age. After 12 years, the Zara's age will be 2 times that of her daughter' age. Find the present age of Zara's and her daughter.**

3. **Solve the linear inequality 3 (2x – 7) = 21 and represent its solution on a number line.**

4. **Define linear inequality and draw a table to describe both algebraic and geometric interpretations of the inequality symbols.**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 5 **Lesson Plan:** 6

**Unit Name:** Linear Equations and Their Graphs **Topic:** Revision **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Linear Equations and Their Graphs”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Linear Equations and Their Graphs”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(32 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(3 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

# Worksheet

**Name: _____** **Date: _____**

1. **Define gradient and intercepts.**

_____
_____
_____
_____

2. **Find the x- and y-intercepts of the graph of the equation x – 3y = – 2.**

3. **Plot the graphs for the following equations of straight lines.**
   a) **y = – 2x**

**b) x – 2y = 5**

**4. Find the slope intercept form if gradient = 3 and y-intercept = – 2.**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 2** **Periodic Unit: 2** **Week:** 5 **Lesson Plan:** 7

**Unit Name:** Geometry **Topic:** Revision **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Geometry”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Geometry”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(32 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(3 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(0 min)**

N/A.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

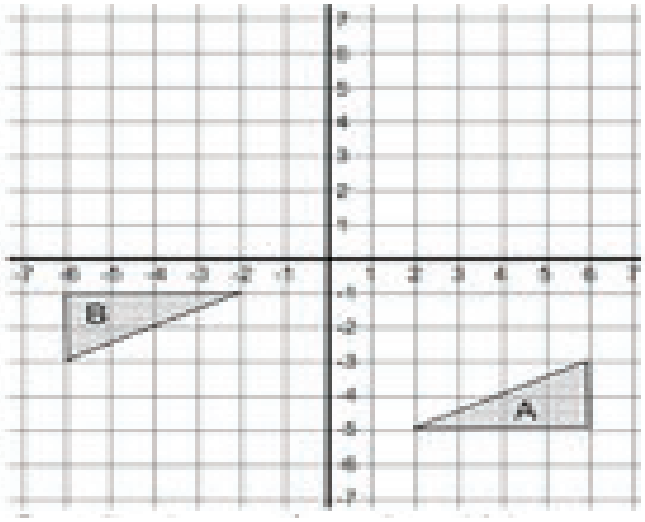
# Worksheet

**Name: _____** **Date: _____**

1. **Draw a rectangle on the coordinate plane. Then rotate it through $90^0$ clockwise about the origin.**

2. **Find the values of x and y for P' if an image having point P (2, – 3) is rotated.**
   **i) $90^0$ anticlockwise** **ii) $180^0$ clockwise**

**3. Find the centre of rotation for the given graph.**



| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 1 **Lesson Plan:** 1

**Unit Name:** Geometry **Topic:** Enlargement **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Define enlargement as a type of transformation.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 132

**Teaching & Learning Activities:**

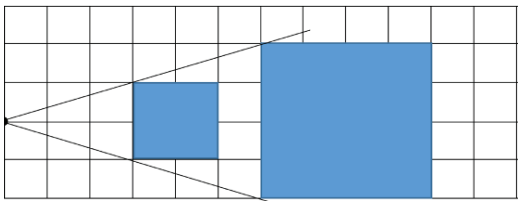
**Opening Activities/Warm-up:** **(5 min)**

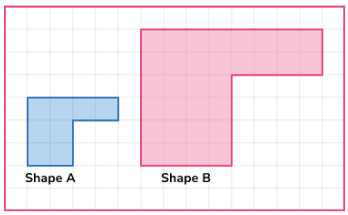
Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: what is meant by rotation of an object? How we can rotate an object clockwise and anticlockwise? Draw a triangle on the board and ask students if we rotate an object 180o anticlockwise then how can rotate an object about its origin? Take their responses and appreciate them for their correct responses. Recall with them how we can rotate the objects clockwise and anticlockwise.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will learn about type of transformation which is called enlargement? Ask students: Do you know about enlargement of shapes? Take their responses and appreciate if someone gives the right answer. Draw two squares on the board of two different sizes. Instruct students to observe the squares and tell what you observe? Take their responses and tell them that the shape is the same but the sizes are different. Tell them that when the shape of the object remains the same but size of the object is change then this type of transformation of object is called enlargement. Draw different shapes and their enlarge image on the board and explain the concept of enlargement. Tell students when we enlarge the shapes the corresponding sides of the original and enlarged figures are in proportion. Tell students when we rotate an objects its size not change we only rotate an object about a fixed point where as in enlargement of figures the size of the shape or objects are change.






**Activity:**

Place the shapes card and their images on the table. Instruct students to come forward and find the cards that show the enlargement of the shapes. Appreciate them for their correct identification.

**Sum Up:** **(3 min)**

Sum up the lesson by recalling with students what is enlargement of shapes and explain “Note to Remember” given at page 132.

**Assessment:** **(5 min)**

Assess students ' understanding by asking students what is meant by enlargement

**Homework:** **(2 min)**

Revise the class work.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 1 **Lesson Plan:** 2

**Unit Name:** Geometry **Topic:** Enlargement of a shape **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify how to enlarge a figure (with the given scale factor)

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 132 and 133, Cartesian plane sheets

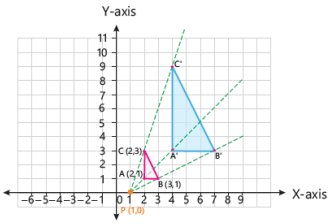
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Ask them: what is meant by enlargement? What is the difference between rotation and enlargement of shape? Take their responses and recall with them the difference between them. Appreciate them for their correct answer.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will learn about how to enlarge the shapes with the given scale factor. Before this ask students what is meant by enlargement of shapes take their responses and tell them that when the shape remains the same and only size of objects are change then that is called the enlargement of the shape. Tell students when we enlarge any figure we need two things one is the scale factor the other one is centre of enlargement. Tell them the center of enlargement is a fixed point around which an enlargement takes place. When a figure is enlarged, every point in the figure moves away from or towards the center of enlargement, and the distance each point moves is proportional to its original distance from the center. The scale factor tells us how much the size of the shape increase. Ask students to open their textbook page 132 and read the statement of the worked example 1. Ask students what is given and what we have to find. Take their responses and tell them that a triangle on the Cartesian plane is given and we have to enlarge it by a scale factor 3 about the centre of enlargement (1, 0). Tell them that first we Identify and note the coordinates of the shape to be enlarged. That are: A(2, 1), B(3,1) and C(2,3) are the coordinates of the vertices of the given triangle. The centre of enlargement is given, i.e., P(1,0). Count and note the distance of each vertex from the centre of enlargement. First consider vertex A. Let's find the coordinates for A' of the enlarged shape. The distance of P from A is (2-1, 1-0) or (1,1). Here the scale factor is 3, so multiply the coordinates of this distance by 3. The distance of P from A' is (1 × 3, 1 × 3) or (3, 3). So A' will be at a distance of (3, 3) from P. Count and mark point A'. Similarly, find the coordinates for B' of the enlarged shape. The distance of P from B is (3-1, 1-0) or (2,1). Here the scale factor is 3, so multiply the coordinates of this distance by 3. The distance of P from B' is (2 × 3, 1 × 3) or (6,3). So, B' will be at a distance of (6, 3) from P. Count and mark point B'. Similarly, C' will be at a distance of (3, 9) from P. Mark it and join the vertices. A'B'C' is the required enlarged figure. Draw the enlarge shape and explain each of enlargement of shape t students and instruct to ask question if they have any confusion.




**Sum Up:** **(3min)**

Sum up the lesson by retelling students the steps to enlarge the shape when the centre of enlargement and scale factor is given.

**Assessment:** **(5 min)**

To assess students, understanding asks them to tell the steps to enlarge the shape when scale factor and centre of enlargement is given. Ask them what is meant by scale factor and centre of enlargement.

**Homework:** **(2 min)**

Solve Q1 (a) of “Learning check 7.2” given at page 133 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 1 **Lesson Plan:** 3

**Unit Name:** Geometry **Topic:** Enlargement **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Enlarge a figure (with the given scale factor).

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 132 and 133, worksheet, Cartesian plane sheets

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. What is meant by scale factor and centre of enlargement of any shape? How we can enlarge the shape when scale factor and centre of enlargement is given. Take their responses and appreciate them for their correct answers.

**Main Activities/Concept Building:** **(22 min)**

Tell students today we will learn to enlarge a shape with the given scale factor. Instruct students to open their textbook page 132 and recall with them the steps to enlarge the shape when scale factor and centre of enlargement is given. Paste the Cartesian coordinate plane sheet on the board and then draw a shape for example rectangle on the board and then enlarge it using a scale factor and centre of enlargement. Ask students during drawing what the next step. Explain each step to them and then instruct to ask questions if they have any confusion and difficulty in understanding.

**Activity:**

Instruct students to work in pairs. Distribute Cartesian coordinate plane to each pair with any shape drawn on it with scale factor and centre of enlargement. Instruct students enlarge the figure using the given scale factor and centre of enlargement. During the activity, the teacher will circulate around the room to observe and check on the students' progress. The purpose is to ensure that everyone is on the right track and to offer assistance if needed. After completing the task instruct to share their working with each other and discuss with each other the steps to enlarge the figure. Appreciate them for their best effort and discuss with them their common mistakes, by encouraging a learning environment where everyone can understand and overcome challenges together. The pair with accurate working in short time will be announced as winner.

**Sum Up:** **(3 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(8 min)**

To check students understanding ask them to open their textbook page 133 and solve Q1 (b) in their notebooks.

**Homework:** **(2 min)**

Complete the given worksheet.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

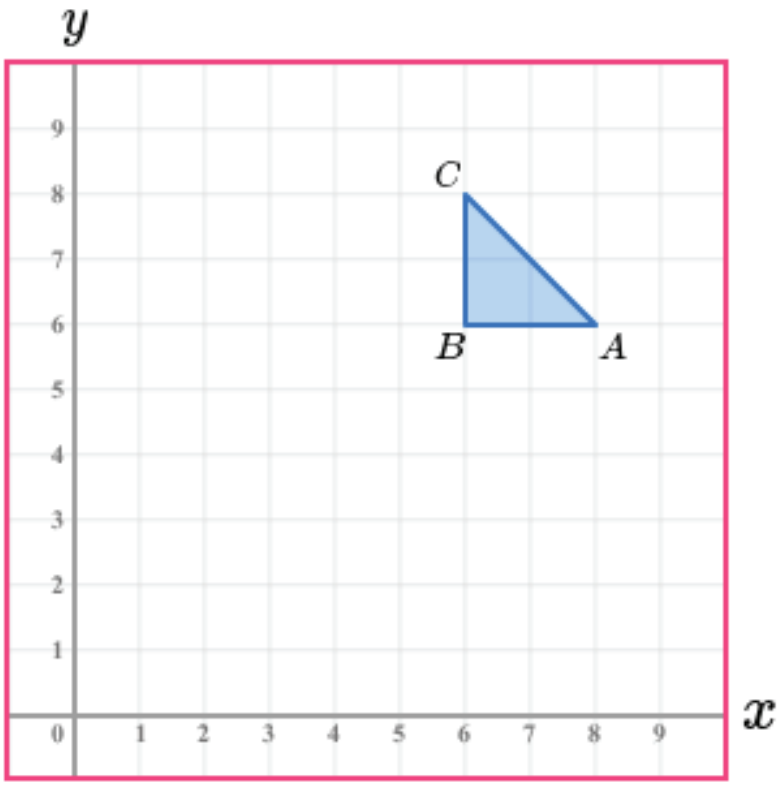
_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

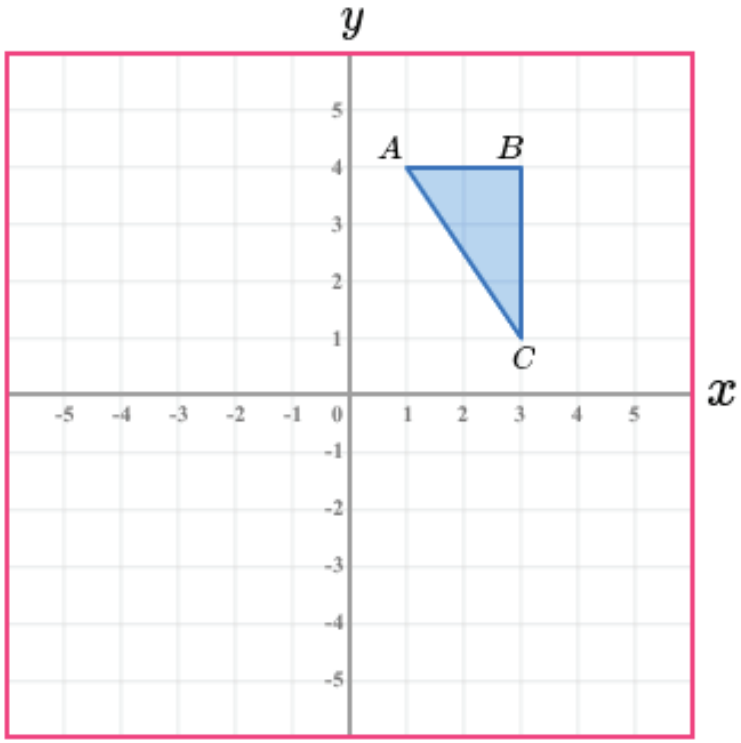
**Worksheet**

**Name: _____** **Date: _____**

1. **Enlarge the given triangle by a scale factor of 3 about the centre of enlargement (8, 8).**




2. **Enlarge the given triangle by a scale factor of – 1 about the centre of enlargement (0, 0).**



| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 1 **Lesson Plan:** 4

**Unit Name:** Geometry **Topic:** Enlargement **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify how to find the centre and scale factor of enlargement.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 133, Graph paper

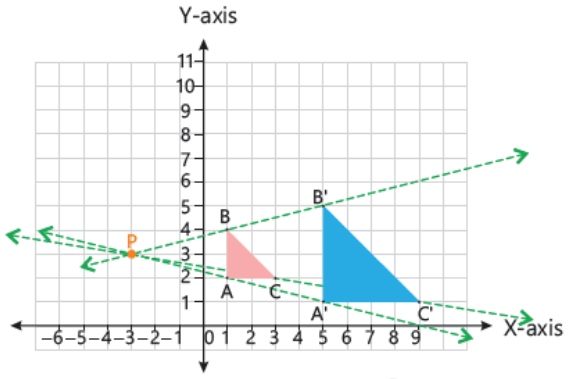
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: how can we enlarge the figure if centre of enlargement and scale factor is given? Take their responses and appreciate them for their best effort and discuss with them their common mistakes. Walk around and check their work and guide them where required.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will identify how to find the centre and scale factor of enlargement if the shape and their enlarge image is given. Ask students: Do you know how we can find the centre of enlargement and scale factor of the enlarged image. Take their responses and appreciate if someone gives the right answer. Instruct the students to open the textbook page 133 and read the statement of the worded example where triangle and its enlarged image is given and we have to find the scale factor and centre of enlargement. Tell students that to find the centre of enlargement of the given figure, join its vertices to the corresponding vertices of the original shape, A to A’, B to B’ and C to C’. Explain them the point where three vertices meet is the centre of enlargement. We can see that the centre of enlargement point is P (– 3, 3). Now tell them about the scale factor of the given image that is the ratio of the length of any side of the new image to the length of the corresponding side of the pre-image. We can see from the both figures A’C’ is 4 units long and the corresponding side AC is 2 units long. So, the scale factor is $\frac{A'C'}{AC} = \frac{4}{2} = 2$




Encourage students to ask questions if they have any confusion. For more clarification draw different objects and their images on the board and find the scale factor and centre of enlargement.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students the steps to find the centre of enlargement and scale factor of the enlarged image.

**Assessment:** **(5 min)**

Assess students understanding; ask them to tell how we can find the scale factor and centre of enlargement of a shape and its enlarged image.

**Homework:** **(2 min)**

Revise the class work.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 1 **Lesson Plan:** 5

**Unit Name:** Geometry **Topic:** Enlargement of a shape **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Find the centre and scale factor of enlargement.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 134, worksheet, Cartesian plane sheets

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: what is meant by scale factor? How we can find the scale factor of any shape? Now draw a shape and its enlarged image with their side’s length on the board and ask students what is the scale factor of the given shape. Take their responses and appreciate for their correct answer and then discuss with them about the scale factor of the given shape.

**Main Activities/Concept Building:** **(22 min)**

Tell students today we will learn to find the scale factor and centre of enlargement of the shape and its enlarged image. Ask students how we can find the scale factor and centre of enlargement of any shape and their enlarged image? Take their responses and instruct students to open their textbook page 134 and read the statement of the Q2 of Learning check 7.2. Tell students we have to find the scale factor and centre of enlargement of a square and its enlarged shape given in part a of Q2, for this first we copy the given shape on the Cartesian plane. Paste the Cartesian plane on the board and copy the shape on the paper. Call a student to the front of the class and ask him/her to find the scale factor and centre of enlargement. Ask the rest of the class to check their work and correct where needed. After this solve this correctly and explain each step to them where they feel difficulty.

**Activity:**

Instruct students to work in pairs. Distribute Cartesian coordinate plane to each pair with any shape and its enlarged image drawn on it. Instruct students to find the scale factor and centre of enlargement. During the activity, the teacher will circulate around the room to observe and check on the students' progress. The purpose is to ensure that everyone is on the right track and to offer assistance if needed. After completing the task instruct to share their working with each other and discuss with each other the steps to enlarge the figure. Appreciate them for their best effort and discuss with them their common mistakes, by encouraging a learning environment where everyone can understand and overcome challenges together. The pair with accurate working in short time will be announced as winner.

**Sum Up:** **(3 min)**

Sum up the lesson by retelling students the steps to find the centre of enlargement and scale factor of any image.

**Assessment:** **(8 min)**

To assess students understanding ask them to open their textbook page 134 and solve Q2 (b) in their notebook.

**Homework:** **(2 min)**

Complete the given worksheet.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

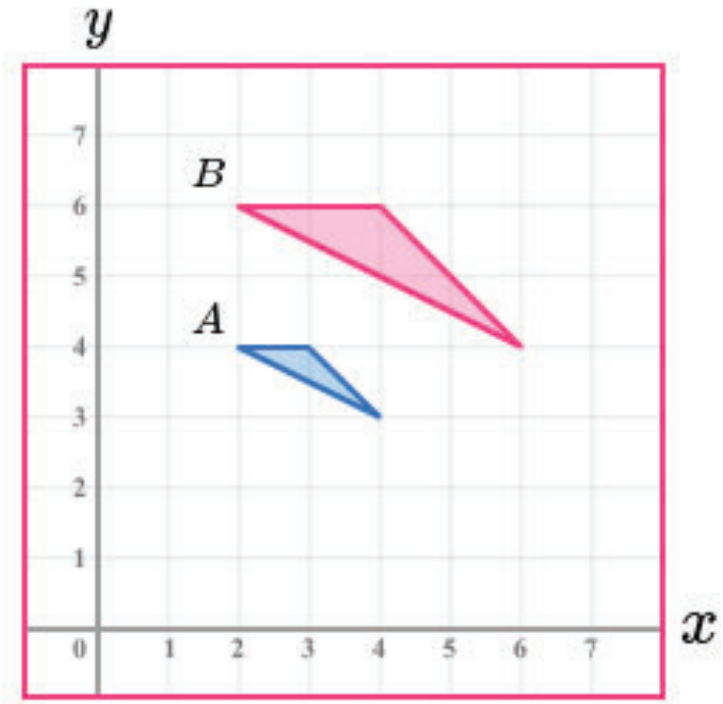
_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

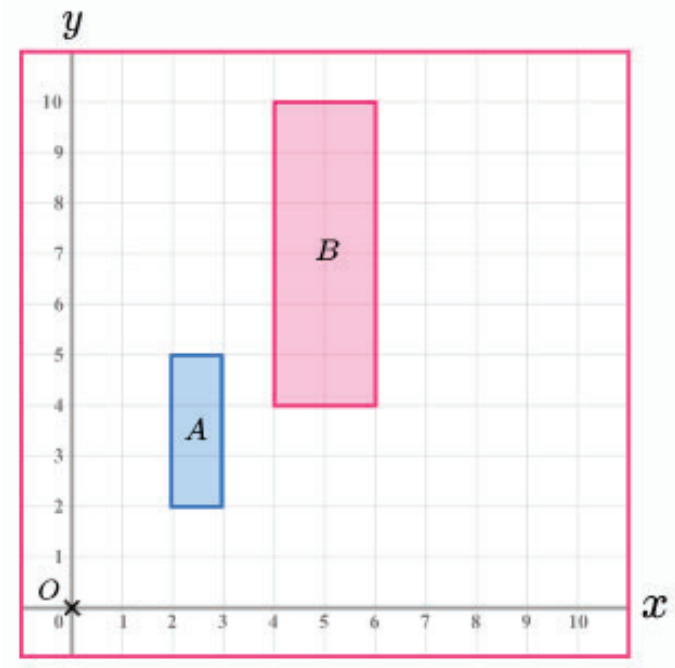
# Worksheet

**Name: _____** **Date: _____**

1. **Copy the given shapes onto Cartesian graph paper. Find their scale factor and the centre of enlargement.**




2. **Copy the given shapes onto cartesian graph paper. Find their scale factor and the centre of enlargement.**



| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 1 **Lesson Plan:** 6

**Unit Name:** Geometry **Topic:** Circle and its parts **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Describe chord, arcs, (major and minor), semi-circle, segment of a circle.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 134 and 135

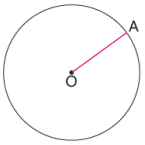
**Teaching & Learning Activities:**

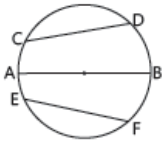
**Opening Activities/Warm-up:** **(5 min)**

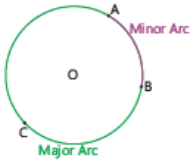
Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: draw an enlarge figure on the board and call a student to the front of the class and instruct him/her to write the centre and scale factor of the given figure. Take their responses, appreciate them for their correct answers, and instruct them to note them in your notebook.

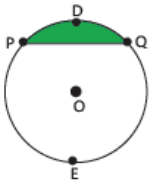
**Main Activities/Concept Building:** **(25 min)**

Tell students today we will learn about circle and its parts like chord, arcs, major and minor arcs, semi-circle and segment of a circle. Ask students: Do you know about circle and its parts. Take their responses and appreciate if someone gives the right answer. Instruct students to open their textbook page 134. Draw a circle on the board and tell them that a circle is made up of all the points in a plane that are always the same distance away from a fixed point that is called centre of the circle O and the fixed distance is called the radius of the circle that is OA. Now draw line segment that whose end points is on the boundary of the circle and tell students when a line segment join any two points on the boundary of the circle that line segment is called a chord. We can draw different chords on a circle, the longest chord is the diameter of the circle that is twice the radius of the circle. In the given figure AB, CD and EF are chords of the circle. Tell students, as we know that boundary of the circle is called the circumference of the circle. A part of the circumference of the circle is called arc of the circle. When an arc that makes an angle of less than 180° at its centre is the minor arc and the arc that makes angle greater than $180^{o}$ is the major arc. In the given circle AB is minor and ACB is the major arc. As the diameter of the circle divide the circle into two equal parts, each half part is called the semicircle. When a chord divides the circle into parts, the region enclosed by chord is called the segment of the circle. When a circle is cut into unequal parts by a chord, the smaller part of the circle is called the minor segment and the larger part of the circle is called the major segment. Tell them that in the given circle DPQ is the minor segment and PEQ is the major segment. Explain about each pats of the circle and encourage students to ask questions if they have any confusion. Instruct students to open their textbook page 134 and 135 and learn about circle and its parts.




**Sum Up:** **(3min)**

Sum up the lesson by retelling students about circle and its parts.

**Assessment:** **(5 min)**

To assess students, understanding ask students to open their textbook page 134 and solve the “Pause and Try” in their notebooks.

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 1 **Lesson Plan:** 7

**Unit Name:** Geometry **Topic:** Circle and its parts **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Describe sector, central angle, interior, exterior, concyclic points, secant, tangent and concentric circles.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 135, 136 and 137

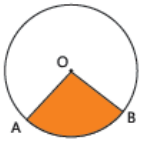
**Teaching & Learning Activities:**

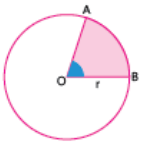
**Opening Activities/Warm-up:** **(5 min)**

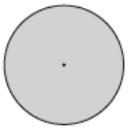
Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: what is meant by chord? Define segment of a circle with figure. What is the difference between minor and major arc? Take their responses, appreciate them for their correct answers, and instruct them to note them in your notebook.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will learn about parts of the circle. Instruct students to open their textbook page 135. Begin the lesson by asking students if they know what a sector of a circle is? Allow some students to give answers or share their ideas. After taking their responses, tell them that a part of the circle bounded by two radii and an arc is known as a sector of a circle. Draw circle on the board and tell them that AOB is the sector of the circle and the unshaded part of the circle is also called sector of the circle. Ask students: what is meant by central angle of a circle? After taking their responses, tell them that an angle subtended at the centre of the circle is known as a central angle. Tell them that in the given circle ∠AOB is the central angle. Ask them: what is the difference between interior and exterior points of the circle? After taking their responses, tell them that points inside the circle are known as interior points, and points outside the circle are known as exterior points. Ask students: what is the difference between concyclic points and concentric circle? After taking their responses, tell them that points lying on the circumference of the same circle are known as concyclic points and two or more circles with same centre but different radii are known as concentric circles. Explain to students the tangent and secant of a circle. Tell them that a tangent is a line that touches the circumference of the circle at a single point, and a secant is a line that cuts the circumference of the circle at two points. Encourage students to ask questions if they have any confusion. For more clarification draw a circle and label its parts and explain about each part.



**Activity:**

Instruct students to open their textbook page 137 and instruct students to solve Q1 and Q2 of “learning check 7.3”. Walk around and check their work and guide them where needed. Appreciate them for their good work.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students about definitions of a circle and its parts given in this lesson.

**Assessment:** **(5 min)**

To assess students, understanding asks them to solve “Pause and try given at page 136 of their textbook.

**Homework:** **(2 min)**

Solve Q3 of the Learning check 7.3 given at page 137.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 2 **Lesson Plan:** 1

**Unit Name:** Geometry **Topic:** Construction of a Triangle **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Construct a triangle when three sides are given (SSS).

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 137, 138 and 141, Ruler, Compass, Protractor, Pencil

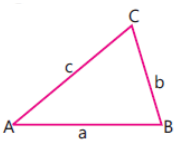
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

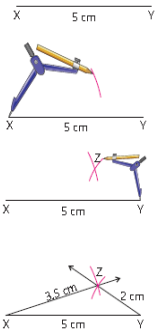
Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students: what is the difference between interior and exterior points of a circle? Differentiate between secant and tangent line of a circle? What are concentric circles? Take their responses; appreciate them for their correct answers.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will construct a triangle when three sides are given (SSS). Begin the lesson by telling students before constructing triangle we will learn about the important property of the triangle that help us to construct the triangle that is called triangle inequality property. Draw a triangle on the board and tell them that according to this property the sum of any two sides of a triangle must be greater than the third side. In other words, if a, b and c are the lengths of the sides of a triangle, then: a + b > c, b + c > a a + c > c




Explain them this property can be applied to any type of triangle. This property helps us to determine whether a given set of three line segments can form a triangle or not. If the sum of two sides is less than the third side, then construction of triangle is not possible. Instruct students to open their textbook page 138 and read the statement of the worked example that is "Construct a triangle XYZ in which $\overline{XY} = 5\ cm$, $\overline{YZ}$ = 3.5 cm and $\overline{XZ}$ = 2 cm". Tell students first we draw a line segment XY of 5 cm with the help of ruler. Now place the pointer of the compass at X and draw an arc of 2 cm. then place the pointer of the compass at point Y and draw an arc of 3.5 cm which cut the previous arc at point Z. Now join X to Z and Y to Z with the help of rule. So, ΔXYZ is the required triangle. Encourage students to ask questions if they have any confusion.




**Activity:**

Instruct students to open their textbook page 141 and read the statement of the Q1 (a) of the "Learning check 7.4" Ask them to tell what is given and what we have to find. Then draw a triangle step by step on the board and explain each step to them. Ask students to solve the question again in their notebook and ask question if they have any confusion.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students about definitions of a triangle and steps to draw a triangle with three sides.

**Assessment:** **(5 min)**

To assess students, learning ask them to solve Q1 (b) of "Learning Check 7.4" given at page 141 in their notebook.

**Homework:** **(2 min)**

Solve Q1 (c-d) of "Learning check 7.4" given at page 141 in their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 2 **Lesson Plan:** 2

**Unit Name:** Geometry **Topic:** Construction of a Triangle **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Construct a triangle when two sides and one angle is given (SAS).

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 139 and 141, Ruler, Compass, Protractor, Pencil

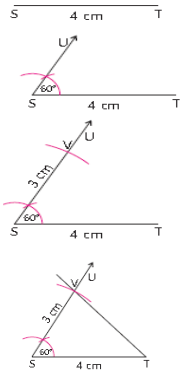
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students: What is the triangle inequality property? How we can construct a triangle when three sides of the triangle are given? Tell the construction steps of a triangle when three sides are given. Take their responses, appreciate them for their correct answers, and instruct them to note them in your notebook.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will construct a triangle when two sides and one angle is given. Instruct students to open their textbook page 139 and read the statement of the worked example that is "Construct a triangle STV in which $\overline{ST} = 4\ cm$, $\overline{SV}$ = 3 cm and $\angle S = 60^0$. To construct a triangle of the given length first choose the greater length that ST = 4 cm. Now take a ruler and draw a line segment $\overline{ST} = 4$ cm. Now place the pointer of the compass at point S and draw an arc of 60°. Now open the compass of 3 cm by measuring from ruler and place the pointer of the compass at point S and draw an arc of length 3 cm that cuts the arm of the angle SU at point V. After this join V to T with the help of ruler. So, ΔSTV is the required triangle. Explain each step of construction to students and encourage students to ask questions if they have any confusion.




**Activity:**

Instruct students to open their textbook page 141 and read the statement of the Q2 (a) of the "Learning check 7.4" Ask them to tell what is given and what we have to find. Then draw a triangle step by step on the board and explain each step to them. Ask students to solve the question again in their notebook and ask question if they have any confusion. Instruct students to solve Q2(b) in their notebooks. Walk around and check their work and guide them where needed.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students about the steps to draw a triangle with two sides and their included angle.

**Assessment:** **(5 min)**

To assess students' learning, have them solve "Pause and try" at page 139 in their notebooks.

**Homework:** **(2 min)**

Solve Q2 (c-d) of "Learning check 7.4" given at page 141 in their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 2 **Lesson Plan:** 3

**Unit Name:** Geometry **Topic:** Construction of a Triangle **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Construct a triangle when two angles and one side is given (ASA).

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 139, 140 and 141, Ruler, Compass, Protractor, Pencil

**Teaching & Learning Activities:**

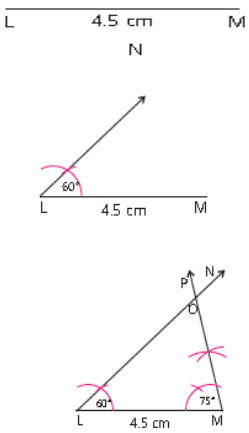
**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students how we can construct a triangle when two sides and one angle is given, tell the step of construction. Take their responses and appreciate for the correct answers.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will construct a triangle when two angles and one side is given.

Instruct students to open their textbook page 139 and read the statement of the worked example that is "Construct a triangle LMO in which $\overline{LM}$ = 4.5 cm, $\angle$L = 60$^o$ and $\angle$M =75$^o$. To construct a triangle of the given length, first take a ruler and draw a line segment $\overline{LM}$ = 4.5 cm. Now place the pointer of the compass at point L and draw an arc of 60°. Now with the same opening of the pointer of the compass place the pointer of the compass at point M and draw an angle of 75$^o$. Now with the help of ruler draw a line LN from point L that passes through the angle 60$^o$ and then draw a line MP from point M that passes through the angle 75$^o$. These two lines LN and MP cut each other at point O. So, ΔLMO is the required triangle. Explain each step of construction to students and encourage students to ask questions if they have any confusion.




**Activity:**

Instruct students to open their textbook page 141 and read the statement of the Q3 of the "Learning check 7.4" Ask them to tell what is given and what we have to find. Then draw a triangle of 'part a' step by step on the board and explain each step to them. Ask students to solve the question again in their notebook and ask question if they have any confusion. Instruct students to solve Q3 (b) in their notebooks. Walk around and check their work and guide them where needed.

**Sum Up:** **(3min)**

Sum up the lesson by recalling with students the steps of construction of triangle when 2 angles and one side is given.

**Assessment:** **(5 min)**

To assess students' learning, ask them to solve Q3 (c) of "Learning Check 7.4" given at page 141 in their notebook.

**Homework:** **(2 min)**

Solve Q3 (d) of "Learning check 7.4" given at page 141 in their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 2 **Lesson Plan:** 4

**Unit Name:** Geometry **Topic:** Construction of a Triangle **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Construct a triangle when Hypotenuse and one side of a right-angled triangle is given (HS).

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 140 and 141, Ruler, Compass, Protractor, Pencil

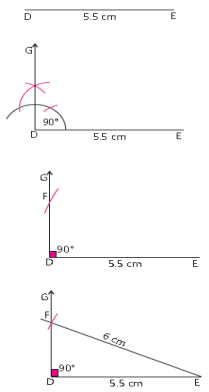
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students: construct a triangle ΔABC in which $\overline{AB} = 6\ cm$, ∠A = $30^0$ and ∠B= $60^0$. Take their responses, appreciate them for their correct answers, and instruct them to note them in your notebook.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will construct a right-angled triangle when length of one side and length of hypotenuse is given. Instruct students to open their textbook page 140 and read the statement of the worked example that is "Construct a right angled triangle EDF in which $\overline{DE}$ = 5.5 cm and EF (hypotenuse) = 6 cm. To construct a triangle of the given length, first take a ruler and draw a line segment $\overline{DE}$ = 5.5 cm. Now place the pointer of the compass at point D and draw an angle of 90°. Now place the pointer of the compass at point E and draw an arc of 6 cm the cut the arm of DG of angle 90 degree at point F. Now with the help of ruler draw a line that join F to E. So, ΔEDF is the required triangle. Explain each step of construction to students and encourage students to ask questions if they have any confusion.




**Activity:**

Instruct students to open their textbook page 141 and read the statement of the Q4 of the "Learning check 7.4" Ask them to tell what is given and what we have to find. Then draw a triangle of 'part a of Q4' step by step on the board and explain each step to them. Ask students to solve the question again in their notebook and ask question if they have any confusion. Instruct students to solve Q4 (b) in their notebooks. Walk around and check their work and guide them where needed.

**Sum Up:** **(3min)**

Sum up the lesson by recalling with students the steps of construction of triangle when hypotenuse length and length of one side is given. Also explain the "Note to Remember" given at page 140 of their textbook.

**Assessment:** **(5 min)**

To assess students, ask them to solve Q4 (c) of "Learning Check 7.4" given at page 141 in their notebook.

**Homework:** **(2 min)**

Solve Q4 (d) of "Learning check 7.4" given at page 141 in their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 2 **Lesson Plan:** 5

**Unit Name:** Geometry **Topic:** Construction a square **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Construct a square.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 142 and 144, Board geometry box

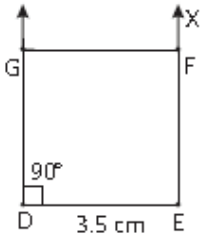
**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students how we construct a right-angled triangle when length of one side, length of hypotenuse is given? Take their responses and ask someone randomly tell the steps of construction of triangle. Take their responses and appreciate for their correct responses.

**Main Activities/Concept Building: (25 min)**

Tell students today that we will construct a square. Begin the lesson by asking students if they know what a square is? Allow some students to give answers or share their ideas. After taking their responses, tell them that a square is a quadrilateral with four equal sides and four right angles. Instruct students to open their textbook page 142 and read the statement of the worked example that is “Construct a square DEFG in which side m$\overline{DE}$ = 3.5 cm.” Tell students first we draw a line segment m$\overline{DE}$ of 3.5 cm with the help of a ruler. Draw a line segment of 3.5 cm on the board with the help of ruler. Now by using a protractor or set squares, draw a right angle at point D, i.e., ∠D = $90^0$. Similarly, by using a protractor or set square, draw a right angle at point E, i.e., ∠E = $90^0$. Now with the help of ruler mark points F and G on each of the newly drawn arms of the two right angles, respectively, such that $\overline{DG}$ = $\overline{EF}$ = 3.5 cm. Join the point E to F and D to G and G to F. So, DEFG is the required square. Explain them each step of construction to students and encourage them to ask questions if they have any confusion.




**Activity:**

Instruct students to open their textbook page 144 and read the statement of the Q1 (a) of the “Learning check 7.5” Ask them to tell what is given and what we have to find. Then draw a square step by step on the board and explain each step to them. Ask students to solve the question again in their notebook and ask question if they have any confusion.

**Sum Up: (3min)**

Sum up the lesson by recalling with students the steps of construction of the square.

**Assessment: (5 min)**

To assess students, ask them to solve Q1 (b) of “Learning Check 7.5” given at page 144 in their notebook.

**Homework: (2 min)**

Solve Q1 (c) of “Learning check 7.5” given at page 144 in their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 2 **Lesson Plan:** 6

**Unit Name:** Geometry **Topic:** Construction a rectangle **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Construct a rectangle.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 142 and 145, Ruler, Compass, Protractor, Pencil

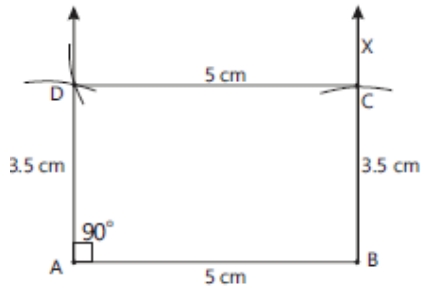
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students: what is meant by a square? Write the construction steps of a square. Take their responses; appreciate them for their correct answers.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will construct a rectangle. Begin the lesson by asking students if they know what a rectangle is? Allow some students to give answers or share their ideas. After taking their responses, tell them that a rectangle is a quadrilateral with opposite sides are equal in length and with 4 right angles. Instruct students to open their textbook page 142 and read the statement of the worked example that is "Construct a rectangle ABCD in which side m$\overline{AB}$ = 5 cm and m$\overline{BC}$ = 3.5 cm." First draw a line segment m$\overline{AB}$ = 5 cm with the help of a ruler on the board. Now with the help of protractor or set square draw angle of $90^0$ at A and B. Now open the pointer of the compass of 3.5 cm measure with the help of ruler and with B as the centre, draw an arc of radius 3.5 cm that cuts $\overrightarrow{BX}$ at point C. Using the same opening of the compasses, draw an arc with A as the centre, cutting $\overrightarrow{AY}$ at point D. Then join C with D. So, ABCD is the required rectangle. Explain construction of rectangle step by step on the board and encourage them to ask questions if they have any confusion.




**Activity:**

Instruct students to open their textbook page 145 and read the statement of the Q2 (a) of the "Learning check 7.5" Ask them to tell what is given and what we have to find. Then draw a rectangle step by step on the board and explain each step to them. Ask students to solve the question again in their notebook and ask question if they have any confusion.

**Sum Up:** **(3min)**

Sum up the lesson by recalling with students the steps to construct a rectangle.

**Assessment:** **(5 min)**

To assess students ' understanding ask them to solve "Pause and Try" given at page 142 of their textbook.

**Homework:** **(2 min)**

Solve Q2 (b) of "Learning check 7.5" given at page 145 in their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 2 **Lesson Plan:** 7

**Unit Name:** Geometry **Topic:** Construction a parallelogram **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Construct a parallelogram.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 143 and 145, Board geometry box, index cards of measurements of sides of parallelogram and included angle

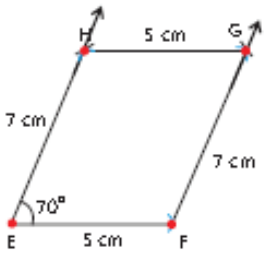
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: what is meant by a rectangle? Write the construction steps of a rectangle. Take their responses, appreciate them for their correct answers, and instruct them to note them in your notebook.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will construct a parallelogram. Begin the lesson by asking students if they know what a parallelogram is? Allow some students to give answers or share their ideas. After taking their responses, tell them that a parallelogram is a quadrilateral with opposite sides and angles that are equal. Instruct students to open their textbook page 143 and read the statement of the worked example that is “Construct a parallelogram EFGH in which side m$\overline{EF}$ = 5 cm and m$\overline{EH}$ = 7 cm and the included angle is $70^{o}$.” First take a ruler and draw a line segment $\overline{EF}$ equal to 5 cm. Now place the protractor at point E, construct a $70^{0}$ angle. With the help of ruler or compass, mark a point H such that $\overline{EH}$ = 7 cm. Again with the help of compass or ruler draw an arc of 7 cm from point F. Now place the Pointer of the compass at point H, stretch it to 5 cm, and draw an arc that intersects the previous arc at point G. Join G to H and F to G. So, EFGH is the required parallelogram. Construct the parallelogram step by step on the board and explain it to students and encourage them to ask questions if they have any confusion.




**Activity:**

Have students to work in pairs. Give each pair an index card where length of sides of the parallelogram and one included angle is written. Instruct them to construct the parallelogram in their notebooks. Walk around and check their work and guide them where they feel difficulty. After completing the task each pair share their findings with each other. Appreciate them for their good work.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students about definition and examples of a parallelogram.

**Assessment:** **(5 min)**

To assess students ' understanding, ask them to solve “Pause and Try part one” given at page 143 of their textbook.

**Homework:** **(2 min)**

Solve Q4 of “Learning Check 7.5” given at page 145 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 3 **Lesson Plan:** 1

**Unit Name:** Geometry **Topic:** Construction a rhombus **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Construct a rhombus.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 143 and 145, Board geometry box

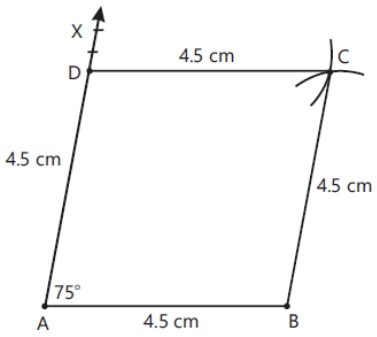
**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: write the properties of a parallelogram. Take their responses, appreciate them for their correct answers, and instruct them to note them in your notebook.

**Main Activities/Concept Building: (25 min)**

Tell students today that we will construct a rhombus. Begin the lesson by asking students if they know what a rhombus is? Allow some students to give answers or share their ideas. After taking their responses, tell them that a rhombus is a quadrilateral with all sides and opposite angles are equal. Instruct students to open their textbook page 143 and read the statement of the worked example that construct a rhombus ABCD in which side m$\overline{AB}$ = 4.5 cm and ∠A = $75^0$. Take ruler and draw a line segment AB equal to 4.5 cm on the board. With the help of compass or protractor draw and angle of 75 degree at point A, on the arm of this angle, mark a point D such that $\overline{AD}$ = 4.5 cm with the help of ruler. Now place the pointer of the compass at point B and draw an arc of measure 4.5 cm. Place the pointer of the compass at point D and draw an arc of 4.5 cm that intersects the previous arc, naming the point where they meet as C. Now join C to D and B to C. ABCD is the required rhombus. Draw step by step rhombus on the board and explain each step to them. Encourage students to ask questions if they have any confusion.




**Activity:**

Instruct students to open their textbook page 145 and read the statement of the Q3 (a) of the “Learning check 7.5” Ask them to tell what is given and what we have to find. Instruct students to construct the rhombus in their notebook. Walk around and check their work and guide them where needed.

**Sum Up: (3min)**

Sum up the lesson by retelling students about definition and examples of a rhombus.

**Assessment: (5 min)**

To assess students ' understandings ask them to solve “Pause and Try second part” given at page 143 of their textbook.

**Homework: (2 min)**

Solve Q3 (b) of “Learning check 7.5” given at page 143 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 3 **Lesson Plan:** 2

**Unit Name:** Geometry **Topic:** Construction a kite **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Construct a kite.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 144 and 145, board geometry box

**Teaching & Learning Activities:**

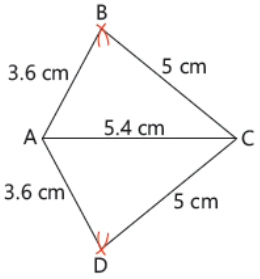
**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students: what is meant by rhombus? Tell the steps to construct a rhombus. Take their responses; appreciate them for their correct answers.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will construct a kite. Begin the lesson by asking students if they know what a kite is? Allow some students to give answers or share their ideas. After taking their responses, tell them that kite is a quadrilateral with two pairs of equal adjacent sides and unequal diagonals. Explain them the longer diagonal of a kite bisects the shorter diagonal perpendicularly.

Instruct students to o pen their textbook page 144 and read the statement of the worked example that is "Construct a kite ABCD when the length of its longer diagonal is 5.4 cm and the lengths of its two sides are 3.6 cm and 5 cm." First draw a line segment $\overline{AC}$ = 5.4 cm with the help of a ruler. Place the pointer of the compass at point A and draw arcs of 3.6 cm above or below the line segment AC. Now place the pointer of the compass at point C and draw arcs of 5 cm above and below the line segment AC that cut the previous arc at point B and D, join A with B, B with C, C with D and D with A. ABCD is the required kite. Construct kite step by step on the board and explain each step to them Encourage students to ask questions if they have any confusion.




**Activity:**

Instruct students to open their textbook page 145 and read the statement of the Q8 of the "Learning check 7.5" Ask them to tell what is given and what we have to find. Instruct them to construct it in their notebook step by step. Walk around and check their work and guide them where needed. Appreciate them for their good work.

**Sum Up:** **(3min)**

Sum up the lesson by retelling about kite and how to construct the kite.

**Assessment:** **(5 min)**

To assess students, ask them to solve Q9 of "Learning Check 7.5" given at page 145 in their notebook.

**Homework:** **(2 min)**

Solve Q10 of "Learning check 7.5" given at page 145 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 3 **Lesson Plan:** 3

**Unit Name:** Geometry **Topic:** Construction a trapezium **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Construct a trapezium.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 144 and 145, Board geometry box

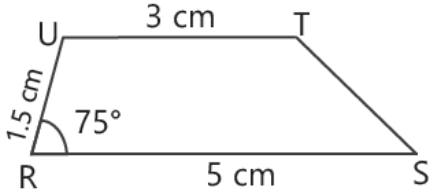
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: what is meant by a kite? Write the construction steps of a kite. Take their responses, appreciate them for their correct answers, and instruct them to note them in your notebook.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will construct a trapezium. Begin the lesson by asking students if they know what a trapezium is? Allow some students to give answers or share their ideas. After taking their responses, tell them that a trapezium is a quadrilateral with at least one pair of parallel sides. Explain to them that parallel sides are called bases. Also, tell them about the height of a trapezium, which is the perpendicular distance between the two bases. Instruct students to open their textbook page 144 and read the statement of the worked example that is “Draw a trapezium RSTU such that $\overline{RS}$ = 5 cm, $\overline{UT}$ = 3 cm, ∠URS = 75°, $\overline{RU}$ = 1.5 cm and $\overline{UT}$ || $\overline{RS}$.” Tell them that first we draw line $\overline{RS}$ = 5 cm with the help of a ruler on the board. Now with the help of protractor or compass draw an angle of 75° at point R. Now place the pointer of the compass at point R and draw an arc of 1.5 cm and mark point U on the arm of the angle. Use a set square and a ruler to draw a line parallel to RS through U of 3 cm and mark point T. in last join S to T. RSTU is the required trapezium. Construct the trapezium on the board step by step and explain each step to them. Encourage them to ask questions if they have any confusion.




**Activity:**

Instruct students to open their textbook page 145 and read the statement of the Q5 of the “Learning check 7.5” Ask them to tell what is given and what we have to find. Instruct them to construct it in their notebook step by step. Walk around and check their work and guide them where needed. Appreciate them for their good work.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students about definition and construction points of a trapezium.

**Assessment:** **(5 min)**

To assess students, ask them to solve Q6 of “Learning Check 7.5” given at page 145 in their notebook.

**Homework:** **(2 min)**

Solve Q7 of “Learning check 7.5” given at page 145 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 3 **Lesson Plan:** 4

**Unit Name:** Geometry **Topic:** Angle Bisectors of a shape **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Construct Angle Bisectors of a Shape.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 145, 146 and 147, Board geometry box

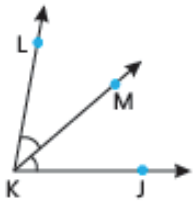
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students: what is meant by a trapezium? Write the construction steps of a trapezium. Take their responses, appreciate them for their correct answers, and instruct them to note them in your notebook.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will construct angle bisectors of a shape. Begin the lesson by asking students if they know what an angle bisector of a shape is? Allow some students to give answers or share their ideas. After taking their responses, tell them that the angle bisectors means to divide the angle into two equal parts. In the figure given, $\overrightarrow{KM}$ is the angle bisector of $\angle$LKJ, which divides $\angle$LKG into two equal angles, $\angle$LKM and $\angle$MKJ. Instruct students to open their textbook page 145 and read the statement of the worked example that construct the angle bisector for a given triangle ABC. First place the pointer of the compass at point B and draw an arc $ED$ of any appropriate radius. With the same opening of the compass draw two arcs from point E and D that intersect each other at point F. With the help of the ruler draw a dotted line that join B to F and extend it. This ray BF is the required angle bisector of angle ABC. Tell them that we can draw angle bisector at point C and A by following the same steps. These bisectors meet at point O. This point O is called its incenter. Ask the students: what is meant by incentre of a triangle? Take their responses and tell them that the point where the three angles bisectors of a triangle meet is called incentre of the triangle. Explain to them in the same way, we can construct angle bisectors of any shape. Encourage students to ask questions if they have any confusion.




**Activity:**

Instruct students to open their textbook page 147 and read the statement of the Q1 of the "Learning check 7.6" Ask them to tell what is given and what we have to find. Then draw angle bisectors of "part a of Q1" step by step on the board and explain each step to them. Ask students to solve the part b in their notebook and Walk around and check their work and guide them where needed.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students how to draw angle bisectors of any shape. Also explain the "Note to Remember" given at page 146 of their textbook.

**Assessment:** **(5 min)**

To assess students, ask them to solve Q1(c) of "Learning Check 7.6" given at page 147 in their notebook.

**Homework:** **(2 min)**

Solve Q1(d, e, f) with respect to angles of "Learning check 7.6" given at page 147 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 3 **Lesson Plan:** 5

**Unit Name:** Geometry **Topic:** Sides Bisectors of a shape **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Construct Bisectors of Sides of a Shape.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 146 and 147, Board geometry box

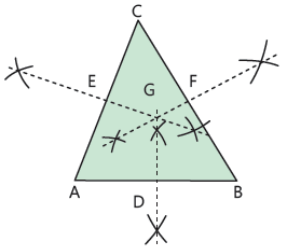
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: what is meant by angle bisector? What is meant by incentre of a triangle? Write the construction steps of angle bisectors of any shape. Take their responses and appreciate them for their correct answers.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will construct bisectors of sides of a shape. Begin the lesson by asking students if they know what a bisector of sides of a shape is? Allow some students to give answers or share their ideas. After taking their responses, tell them that a side bisector is a line segment that divides a side of a any shape into two equal parts. Explain to them the perpendicular bisector of a side of a triangle is a line perpendicular to the side and passing through its midpoint. Instruct students to open their textbook page 146 and read the statement of the worked example that construct the line bisectors of the sides of the given triangle ABC. First place the pointer of compass at point A and open it more than half of the length of the line segment AB and draw two arc above or below the line segment AB. With the same opening of the compass draw two arcs from point B that cut the previous arcs. Now draw a line that passing through these arcs. Explain them this line that is perpendicular bisector of $\overline{AB}$. Similarly, draw line bisectors of sides $\overline{AC}$ and $\overline{BC}$. The point G where the three bisectors of the sides of the triangle meet is called the circumcenter. Explain students in the same way, we can construct bisectors of any shape. Encourage students to ask questions if they have any confusion.




**Activity:**

Instruct students to open their textbook page 147 and read the statement of the Q1 of the “Learning check 7.6” Ask them to tell what is given and what we have to find. Then draw side bisectors of “part a of Q1” step by step on the board and explain each step to them. Ask students to solve the part b for side bisector in their notebook and Walk around and check their work and guide them where needed.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students how to draw angle bisectors of any shape. Also explain the “Note to Remember” given at page 146 of their textbook.

**Assessment:** **(5 min)**

To assess students, ask them to solve Q1(c) of “Learning Check 7.6” given at page 147 in their notebook.

**Homework:** **(2 min)**

Solve Q1(d, e, f) with respect to sides of “Learning check 7.6” given at page 147 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 3 **Lesson Plan:** 6

**Unit Name:** Geometry **Topic:** Congruent Figures **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify congruent figures.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 147, 148 and 149, Paper cards of figures

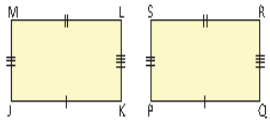
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Begin the lesson by asking students about their homework. Ask students: draw a side bisector of the rectangle in their notebook. What is meant by circumcenter of any shape? Take their responses and appreciate them for their correct work.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will learn about congruent figures. Begin the lesson by asking students if they know what a congruent figure. After taking their responses, tell them that congruent figures have same size and shape. Tell them that in our daily lives, we observe many objects that look exactly the same. Instruct students to open their textbook on page 147 and see that both doors have the same size and shape. Look at the other example of a spoon that have the same size and shape, which is called the congruence of images. Tell the students about the history of the word "congruent, “which comes from the Latin word "congruere,” which means to agree with or correspond with. Explain to them that the symbol for congruence is "≅". The symbol "∼" represents the same shape, and “=” represents the same size. Explain them the matching sides are called corresponding sides, and the matching angles are called corresponding angles. Instruct students to open their textbook on page 148 and look at the rectangles that have same size and shapes. Explain them same size means that have the same sides and angles. Explain them in the above figures of rectangles, JKLM ≅ PQRS. We read it as "JKLM is congruent to PQRS. Tell the students that the corresponding angles and sides are equal as $\overline{JK} = \overline{PQ}$, $\overline{KL} = \overline{QR}$, $\overline{LM} = \overline{RS}$, $\overline{JM} = \overline{PS}$. Explain to students in the same way two lines are said to congruent if they have same length. Two circles are congruent of same radius and two angles that have same measurement are also congruent. Explain the concept of congruency with the help of different real-life examples and encourage them to ask questions if they have any confusion.




**Activity:**

Get students into pair and give each pair some paper cards of the figures. Instruct students to separate the congruent figures. After completing the task each pair come forward and show their working to the whole class. Appreciate them for their good work and discuss with them about their common mistakes.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students about congruent figures and also explain the “Note to Remember” given at page 147 of their textbook.

**Assessment:** **(5 min)**

To assess students, ask them to correctly identify congruent figures during the activity and discussion.

**Homework:** **(2 min)**

Solve Q1 (a-f) of “Learning check 7.7” for congruent figures given at page 149 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 3 **Lesson Plan:** 7

**Unit Name:** Geometry **Topic:** Similar Figures **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify similar figures.

**Resource Material:**

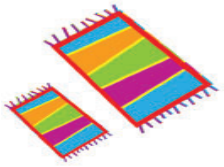
Chalk/Marker, White/Blackboard, textbook page 148, 149 and 150, paper cards of figures

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students: what is meant by congruent objects? Draw two pairs of images and call a student in front of the class to identify the given images and tick the congruent figures. Take their responses and appreciate them for their correct response.

**Main Activities/Concept Building:** **(25 min)**



Tell students today that we will learn about similar figures. Begin the lesson by asking students they know about similar figures? After taking their responses, and ask them to open their textbook page 148 and look at the carpet. Explain them they are similar in shape, but not equal in size. Explain them figures that have the same shape but are not the same size are called similar figures. Tell the students that similar figures are denoted by the symbol '∼' and it is read as "similar to". Explain in detail that two figures are similar if the following properties exist: first is their corresponding angles are equal and the second one is the lengths of their corresponding sides are in proportion (the ratios between the corresponding sides are equal). Look at the trapezium. Explain them the corresponding angles are equal of the given figures: ∠A = ∠L, ∠B = ∠M, ∠C = ∠N and ∠D = ∠O.

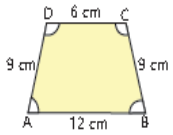


Figure A

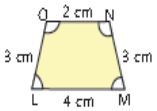


Figure B

Tell the students that all sides of figure A are proportional to the corresponding sides of figure B. So, these figures are similar figures. Encourage students to ask questions if they have any confusion.

**Activity:**

Get students into pair and give each pair some paper cards of the figures. Instruct students to identify and separate the similar figures. Walk around and check their work and guide them if needed. After completing the task each pair come forward and show their working to the whole class. Appreciate them for their good work and discuss with them about their common mistakes.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students about similar figures. Also explain the "Note to Remember" given at page 149 of their textbook.

**Assessment:** **(5 min)**

To assess students, ask them what is the difference between congruent and similar figures?

**Homework:** **(2 min)**

Solve Q1 for similar figures and Q2 of "Learning check 7.7" given at page 150 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 4 **Lesson Plan:** 1

**Unit Name:** Geometry **Topic:** Properties of congruent triangles as (SSS) and (SAS) **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Apply and check congruence between triangles using property: Side-Side-Side(SSS ≅ SSS) and Side-Angle-Side (SAS ≅ SAS)

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 150, 151, 152 and 154

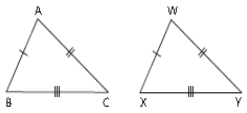
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

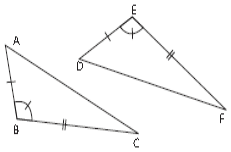
Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students: what is meant by similar objects? Draw a pair of triangles with different lengths and one pair of two triangles with equal lengths, call a student at the front of the class, and identify similar triangles in both pairs of triangles. Take their responses and appreciate them for their correct answers.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will apply and check congruence between triangles using property: Side-Side-Side (SSS ≅ SSS) and Side-Angle-Side (SAS ≅ SAS). Begin the lesson by asking students if they know what an SSS property is? Allow some students to give answers or share their ideas. After taking their responses, tell them that when the measure of three sides of one triangle are equal to the measure of the corresponding three sides of the other triangle, then the two triangles are congruent. Instruct the students to open the textbook page 151 and look at the given triangles ΔABC and ΔWXY. Explain them the measures of all sides of the triangle ABC are equal to the corresponding sides of the triangle WXY,




i.e., $\overline{AB} = \overline{WX}$, $\overline{AC} = \overline{WY}$ and $\overline{BC} = \overline{XY}$. So, ΔABC ≅ ΔWXY. For more clarification solve worked example 1 and 2 step by step on the board. Instruct students to ask questions where they have any confusion. Now ask students if they know what an SAS property is? Allow some students to give answers or share their ideas. After taking their responses, tell them that when the measure of two sides and their included angle of one triangle are equal to the measure of the corresponding two sides and their included angle of the other triangle, then the two triangles are congruent. Instruct the students to open the textbook page 152 and look at the given triangles. Explain to them the measure of two sides of triangle ABC are equal to the corresponding sides of triangle DEF that are $\overline{AB} = \overline{DE}$, $\overline{BC} = \overline{EF}$ and the angle B is equal to angle E so the given triangles ABC and DEF are congruent. For more clarification solve worked example step by step on the board given in the textbook page 152. Encourage students to ask questions if they have any confusion.




**Sum Up:** **(3min)**

Sum up the lesson by retelling students about congruent triangle with properties SSS and SAS. Also explain the "Note to Remember" given at page 151 of their textbook.

**Assessment:** **(5 min)**

To assess students, understanding ask them to draw two congruent triangles that fulfill the SSS property and two triangles that fulfill the SAS property in their notebook.

**Homework:** **(2 min)**

Revise the classwork.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 4 **Lesson Plan:** 2

**Unit Name:** Geometry **Topic:** Properties of congruent triangles **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Apply and check congruence between triangles using property: Angle-Side-Angle (ASA ≅ ASA) Angle-Angle-Side (AAS ≅ AAS) Right-Angle-Hypotenuse-Side (RHS ≅ RHS).

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook page 152, 153, 154 and 155

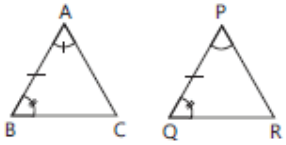
**Teaching & Learning Activities:**

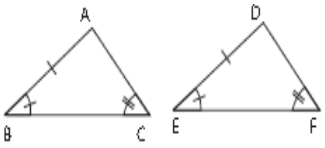
**Opening Activities/Warm-up:** **(5 min)**

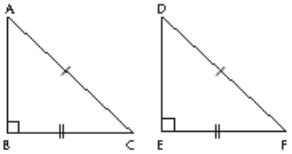
Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Begin the lesson by asking students about their homework. Ask students: differentiate between SSS and SAS property of congruent triangles. Take their responses, appreciate them for their correct answers, and instruct them to note them in your notebook.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will about the properties of the congruent triangles that are: angle-side-angle (ASA ≅ ASA) angle-angle-side (AAS ≅ AAS) right-angle-hypotenuse-Side (RHS ≅ RHS). Begin the lesson by asking students if they know about these properties? Allow some students to give answers or share their ideas. After taking their responses, tell them the two triangles are congruent if two angles and their included side of one triangle are equal to the two corresponding angles and their included side of the other triangle. Instruct the students to open the textbook page 152 and look at the triangle ABC and triangle PQR. Explain to them the two angles ∠A and ∠B and their included side $\overline{AB}$ is equal to the corresponding angle ∠P and ∠Q and their included side $\overline{PQ}$ of the other triangle PQR, i.e. ∠A = ∠P, ∠B = ∠Q and $\overline{AB} = \overline{PQ}$. So, ΔABC ≅ ΔPQR. For more explanation solve the worked example given at page 152 on the board. Encourage students to ask questions if they have any confusion. Tell them that two angles and one of the non-included sides of one triangle are equal to the two corresponding angles and one non-included side of the other triangle, then the two triangles are congruent. Instruct the students to open the textbook page 152 and look at the triangle ABC and triangle DEF. Explain to them the two angles ∠B and ∠C and the non-included side AB is equal to the corresponding angles ∠E and ∠F and one non-included side DE of the other triangle DEF, i.e., ∠B = ∠E, ∠C = ∠F and $\overline{AB} = \overline{DE}$. So, ΔABC ≅ ΔDEF. For more explanation solve the worked example given at page 153 on the board. Encourage students to ask questions if they have any confusion. Ask students: what is meant by HS property? After taking their responses, tell them that if the hypotenuse and one side of right-angled triangle are equal to the corresponding hypotenuse and the side of the other right-angled triangle, then the given triangles are congruent. Instruct the students to open the textbook page 153 and look at the triangle ABC and triangle DEF. Explain to them the length of one side and the hypotenuse of triangle ABC are congruent to the corresponding side and the hypotenuse of triangle DEF, i.e., $\overline{AC} = \overline{DF}$ (hypotenuse) and $\overline{BC} = \overline{EF}$. So, ΔABC ≅ ΔDEF. Instruct the students to open the textbook page 153 and solve the worked example step by step on the board and explain to them. Walk around and check their work and guide them where needed. Encourage students to ask questions if they have any confusion.




**Sum Up:** **(3min)**

Sum up the lesson by retelling students about congruent properties of the triangles that are ASA, SAA and HS. Also explain the "Note to Remember" given at page 152 and 153 of their textbook.

**Assessment:** **(5 min)**

To assess students, ask them to solve Q1 of "Learning Check 7.8" given at page 154 in their notebook.

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Homework:** **(2 min)**

Solve Q2-Q6 of “Learning check 7.8” given at page 154 and 155 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 4 **Lesson Plan:** 3

**Unit Name:** Geometry **Topic:** Sum Up and Unit Check **Date**:__

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 7 by solving Q1-7 of Unit Check Exercise.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook pages 155 and 156

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Tell students that they are going to revise all the concepts of the Unit “Geometry”.
Ask them the different questions that are related to the unit.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Have students open pages 155 and 156 of their textbooks. Ask them to solve Q1 to Q5 of “Unit check 7” of their textbooks. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Sum Up:** **(3 min)**

Sum up the lesson by repeating the important points of unit using sum up given at page 155.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Solve Q6 and Q7 of “Unit check 7” given at page 156 of their textbooks.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 4 **Lesson Plan:** 4

**Unit Name:** Geometry **Topic:** Sum Up and Unit Check **Date**:__

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 7 by solving Q8-13 of Unit Check Exercise.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook pages 155, 156 and 157

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Tell students that they are going to revise all the concepts of the Unit “Geometry”.
Ask them the different questions that are related to the unit.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Have students open pages 156 of their textbooks. Ask them to solve Q8 to Q10 of “Unit check 7” of their textbooks. Walk around the class, check their work and appreciate them for the correct solutions. Guide them if required.

**Sum Up:** **(3 min)**

Sum up the lesson by repeating the important points of unit using sum up given at page 155.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Solve Q11 to Q13 of “Unit check 7” given at page 156 and 157 of their textbooks.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 4 **Lesson Plan:** 5

**Unit Name:** Geometry **Topic:** Sum Up and Unit Check **Date:**__

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 7 by solving Q14-17 of Unit Check Exercise and by completing "work with math" activity.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook pages 157 and 158, shapes cut out, print of coordinate plane, pencils and ruler.

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Tell students that they are going to revise all the concepts of the Unit "Geometry".
Ask them the different questions that are related to the unit.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Have students open pages 157 of their textbooks. Ask them to solve Q14 and Q15 of "Unit check 7" of their textbooks. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Activity 2:**

Tell students that now we are going to do an activity of 'work with math' on page 158.

- Get students into 3 groups.
- Give each group a print of a coordinate plane and cut-outs of various shapes.
- Instruct them to paste any shape on the coordinate plane.
- Then ask them to pin it using a thumb pin and rotate it about that point.
- Explain them this will be the centre of rotation.
- Ask them to use the same shape with different locations and centers and then record their observations.
- Similarly, ask them to explore enlargement of objects by using cut-outs of shapes on the coordinate plane.

**Sum Up:** **(3 min)**

Sum up the lesson by repeating the important points of unit using sum up.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Solve Q16 and Q17 of Unit check 7 given at page 157 and 158 of their textbooks

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 4 **Lesson Plan:** 6

**Unit Name:** Surface Area and Volume **Topic:** Pythagoras' Theorem **Date:**__

**Objective(s):**

**At the end of this period, the students will be able to:**

State Pythagoras' theorem and its use to solve right-angled triangles.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook pages 159, 160, 161 and 162

**Teaching & Learning Activities:**

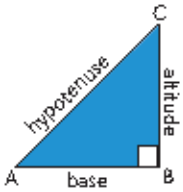
**Opening Activities/Warm-up:** **(8 mins)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask the students: How are you? Encourage them to say, "Alhamdulillah". Start with 'Bismillah' and tell them to recite it before starting any work. Have students open textbook at page 159. Quickly recall the concepts related to questions given in rapid recall. Then ask them to solve those questions. Read the opening page question and tell them that we will be able to solve it after learning about the concepts of the unit.

(***Note for teachers:*** *The sections "Think out of the box", "Talk over and write" and "Technology corner" are supplementary exercises. These can also be given to students who finish their work quickly or are fast learners.)*

**Main Activities/Concept Building:** **(22 min)**

Before the main concept, tell them briefly about the unit outline and its real-life relevance. Tell students today that we will state Pythagoras' theorem and its use to solve right-angled triangles. Begin the lesson by asking students if they know what a Pythagoras theorem is? Allow some students to give answers or share their ideas. After taking their responses, draw a right-angled triangle on the board and state that the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the other two sides. Tell the students that Pythagoras explain the relationship between the lengths of the sides of the right-angled triangle. Tell the students that the relationship between the sides of the right-angled triangle can be described by the following formula:




$(\overline{AC})^2 = (\overline{AB})^2 + (\overline{BC})^2 \Rightarrow$ (Hypotenuse)$^2$ = (Base)$^2$ + (Altitude)$^2$

Tell them if any two sides of right triangle are given, then we can find the third side by applying the Pythagoras theorem. Instruct the students to open the textbook page 160 and solve the worked example 1 step by step on the board. Encourage students to ask questions if they have any confusion. For more clarification solve the worked examples 2 step by step on the board. Encourage students to ask questions if they have any confusion.

**Activity:**

Instruct students to open their textbook page 162 and read the statement of the Q1 of the "Learning check 8.1" Ask them to tell what is given and what we have to find. Ask them to solve Q1 (a, b) step by step in their notebook. Walk around and check their work and guide them where needed.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students about Pythagoras theorem and its use.

**Assessment:** **(5 min)**

To assess students ' understanding ask them to solve "Pause and Try" given at page 160 of their textbook.

**Homework:** **(2 min)**

Solve Q1(c-f), Q2, Q3 of "Learning check 8.1" given at page 162 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 4 **Lesson Plan:** 7

**Unit Name:** Surface Area and Volume **Topic:** Pythagoras' Theorem **Date**:__

**Objective(s):**

**At the end of this period, the students will be able to:**

Use Pythagoras' theorem to solve right-angled triangles.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook pages 161, 162 and 163

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaamu Alaikum" and start with the name of Allah.

Ask students: How are you? Encourage them to say, "Alhamdulillah".

Ask students about their previous day homework. Begin the lesson by asking students what is meant by Pythagoras theorem? Take their responses and call a student to the front of the class and ask him/her to write the formula of Pythagoras theorem. Ask the rest of the class to check and tell he/she is right and correct if needed.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will use Pythagoras' theorem to solve right-angled triangles. Instruct students to open their textbook page 161 and read the statement of the worked example 3 and tell what is given and what we have to find. Take their responses and tell them that hypotenuse of the right-angled triangle field is given that is 30 m, if the length of its base is 24 m, and then we have to find the length of its altitude. Solve the example step by step on the board and explain each step to them. Encourage students to ask questions if they have any confusion.

**Activity:**

Instruct students to open their textbook page 162. Instruct them to read the statement of the Q4 of the learning check 8.1 and tell what is given and what we have to find. Take their responses and tell them that the length of altitude and base if given and we have to find the length of hypotenuse of the right-angled triangle. Call a students to the front of the class and ask him/her to solve the question on the board and ask the rest of the class to check and tell whether he/she doing correctly. Check and correct where needed. Instruct students to solve Q5, Q6 and Q7 in their notebooks. Walk around and check their work and guide them where needed.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students how to solve the right-angled triangle by using Pythagoras' theorem.

**Assessment:** **(5 min)**

To assess students ' understanding ask them to solve "Pause and Try" given at page 161 of their textbook.

**Homework:** **(2 min)**

Solve Q8, Q9 and Q10 of "Learning check 8.1" given at page 163 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 5 **Lesson Plan:** 1

**Unit Name:** Surface Area and Volume **Topic:** Arc Length of a Circle **Date:**__

**Objective(s):**

**At the end of this period, the students will be able to:**

Calculate the arc length of a circle.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook pages 163, 164, 166 and 167

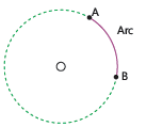
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(7 mins)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Ask students about their previous day homework. Write the statement on the board " Find the length of the diagonal from one corner to the opposite corner of the rectangular soccer if it has a length of 100 m and a width of 50 m." Call a student to the front of the class and ask him/her to draw a rectangle and draw the length and width of 100 m and 50 m, respectively. Then draw a diagonal and find the length of the given diagonal of the rectangular soccer. Instruct the rest of the class to check whether he /she is correct or not.

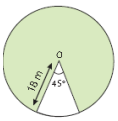
**Main Activities/Concept Building:** **(23 min)**

Tell students today that we will learn how to calculate the arc length of a circle. Begin the lesson by asking students if they know what an arc length of a circle is? After taking their responses, Draw a circle on the board and point out two point A and B on the circumference of the circle as given in the textbook page 163 and tell an arc is any part of the circumference of a circle. Explain them an arc has two end points, A and B, that are denoted by $\widehat{AB}$. Tell them that as the circumference of the circle having radius r and a central angle $360^o$ is $2\pi r$. Explain the formula to find the arc length of a circle if radius and central angle is given.




Arc length of a circle with a central angle $\theta = \frac{1}{360^0} \times 2\pi r$

Tell the students that the $\theta$ is the angle subtended at the centre, given in degree and r is the radius of the circle. Instruct students to open their textbook page 164 and read the statement of the worked example 1 that a circular park has a radius of 18 m and a central angle of a sector of circle is 45°. Tell them we have to find the arc length of the curved path of the given circle. Solve the example step by step on the board and explain each step to them. For more clarification, solve the worked example 2 on the board and encourage the students to ask questions if they have any confusion.




**Activity:**

Instruct students to open their textbook page 166 and read the statement of the Q1 of "Learning check 8.2". Instruct students to solve Q1 for the arc length in their notebooks. Walk around and check their work and guide them where needed. Appreciate them for their good work.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students how to find the arc length of the circle by using formula. Also explain the "Note to Remember" given at page 163 of their textbook.

**Assessment:** **(5 min)**

To assess students' understanding ask them to solve Q2 (a, b) for arc length in their notebooks.

**Homework:** **(2 min)**

Solve Q2(c-f) for arc length and Q5 of "Learning check 8.2" given at page 166 and 167 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 5 **Lesson Plan:** 2

**Unit Name:** Surface Area and Volume **Topic:** Area of a Sector of a Circle **Date:**__

**Objective(s):**

**At the end of this period, the students will be able to:**

Calculate the area of the sector of a circle.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook pages 164, 165, 166 and 167

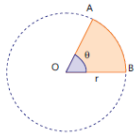
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Ask students about their previous day homework. Ask students: what is meant by arc length of a circle? How we can find the arc length of the circle Call a student to the front of the class and ask him/her to write the formula to find the arc length of the circle. Take their responses and appreciate for their correct answer.

**Main Activities/Concept Building:** **(23 min)**

Tell students today that we will calculate the area of the sector of the circle. Begin the lesson by asking students if they know what is meant by sector of the circle? After taking their responses, tell them that sector is a part of a circle bounded by two radii and an arc. Instruct the students to open the textbook page 164 and look at the circle. Explain them r is the radius and $\theta$ is the central angle of a sector of a circle. Tell the students how to find the area of a sector of a circle enclosed by two radii OA and OB and the minor arc AB. Explain them that a complete circle has a central angle equal to $360^0$ and the area of a circle with a central angle of $360^0$ is equal to $\pi r^2$ (where r is the radius of the circle and the value of $\pi$ is approximated at 3.14.




Area of a circle with a central angle of $360^o = \pi r^2$

Area of a sector with a central angle of $1^o = 1/360^o \times \pi r^2$

Area of a sector with a central angle of $\theta = \frac{\theta}{360} \times \pi r^2$

Explain the formula to find the area of sector of a circle that is $\pi r^2$. Instruct students to open their textbook page 165 and read the statement of the worked example 1 that a windshield wiper of a car is 82 cm long. The angle within which it moves while wiping is $120^0$. Find the area of its wipes step by step on the board. For more clarification, solve the worked example 2 step by step on the board and encourage the students to ask questions if they have any confusion.

**Activity:**

Instruct students to open their textbook page 166 and read the statement of the Q1 of "Learning check 8.2". Instruct students to solve Q1 for the area of the sector in their notebooks. Walk around and check their work and guide them where needed. Appreciate them for their good work.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students how to find the area of the sector of the circle by using formula. Also explain the "Note to Remember" given at page 164 of their textbook.

**Assessment:** **(7 min)**

To assess students' understanding ask them to solve Q2 (a, b) for area of the sector in their notebooks.

**Homework:** **(2 min)**

Solve Q2(c-f) for area of sector and Q3, Q4 and Q6 of "Learning check 8.2" given at page 166 and 167 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 5 **Lesson Plan:** 3

**Unit Name:** Geometry **Topic:** Revision **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Geometry”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Geometry”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(32 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

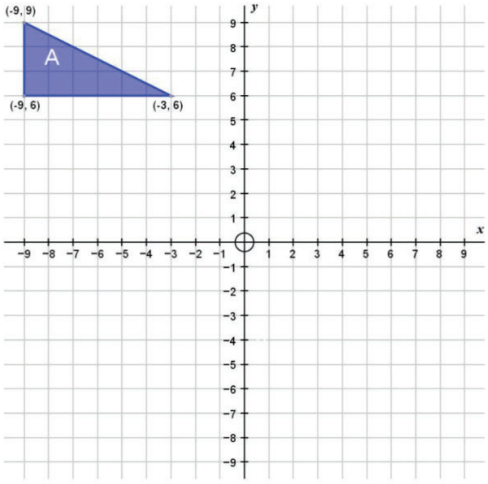
| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Worksheet**

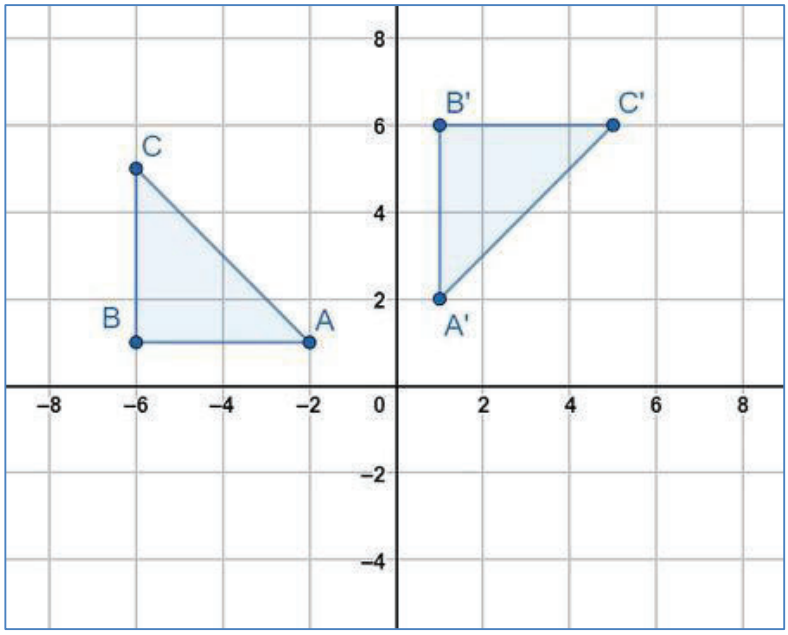
**Name: _____** **Date: _____**

1. **Find the values of *x* and y for P' if an image having point P (–2, 8) is rotated:**
   a) $90^{O}$ clockwise b) $180^{O}$ anticlockwise c) $270^{O}$ clockwise

2. **Enlarge the given triangle by a scale factor of $\frac{1}{3}$ about the centre of enlargement (–3, –6).**



**3. Find the centre of rotation for the rotated image of A'B'C' of triangle ABC.**



| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 5 **Lesson Plan:** 4

**Unit Name:** Geometry **Topic:** Revision **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Geometry”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Geometry”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(32 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Worksheet**

**Name: _____** **Date: _____**

1. **Differentiate between interior and exterior points of a circle.**

2. **Differentiate between tangent and secant of a circle.**

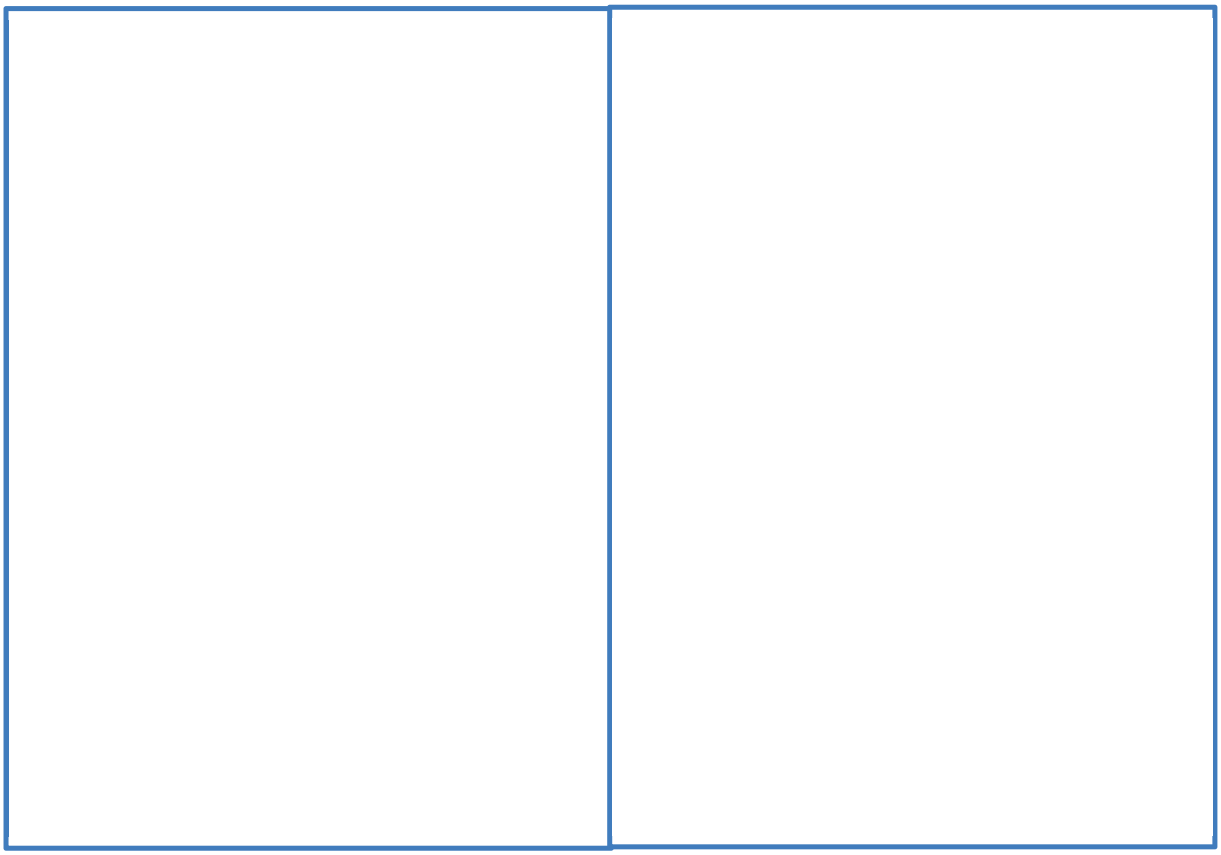
3. **Draw the following triangles using a compass and a ruler. (if possible)**

a) $\overline{AB}$ = 3 cm, $\overline{AC}$ = 6 cm, $\overline{BC}$ = 4 cm

b) $\overline{XY}$ = 4.5 cm, $\overline{YZ}$ = 3.5 cm, $\angle Y = 60^0$

**4. Draw the following triangles using a compass and a ruler. (if possible)**

a) $\overline{DE}$ = 5 cm, $\angle D = 75^0$, $\angle E = 30^0$ b) $\overline{LM}$ = 3.2 cm, $\overline{LN}$ = 6 cm (hypotenuse)



| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 5 **Lesson Plan:** 5

**Unit Name:** Geometry **Topic:** Revision **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Geometry”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Geometry”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(32 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Worksheet**

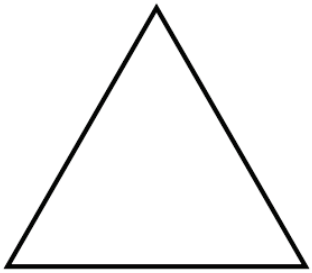
**Name: _____** **Date: _____**

1. **Construct a square for each of the length is 4 cm.**

2. **Draw a trapezium WXYZ such that $\overline{AB}$ || $\overline{CD}$, DC = 4.5 cm, $\overline{AB}$ = 6.2 cm, $\overline{BC}$ = 2.3 and ∠BCD = $75^0$.**

3. **Construct a parallelogram WXYZ when $\overline{WX}$ = 5 cm, $\overline{WZ}$ = 7 cm and the angle between them is 60°.**

**4. Draw sides and angles bisectors of given triangle.**



| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 5 **Lesson Plan:** 6

**Unit Name:** Geometry **Topic:** Revision **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Geometry”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Geometry”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building: (32 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up: (5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment: (0 min)**

N/A

**Homework: (2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

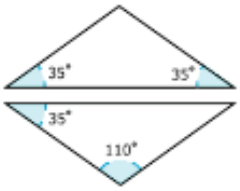
| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Worksheet**

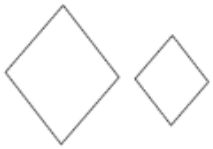
**Name: _____** **Date: _____**

**1. Identify the following pairs of figures that are either congruent or similar to each other.**

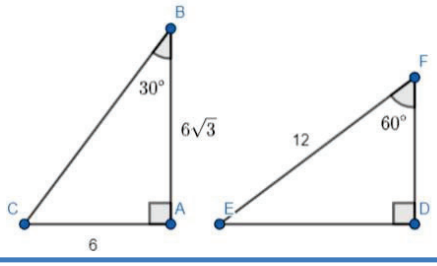
a)




b)

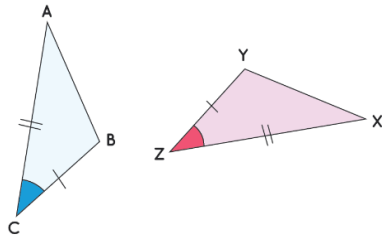


**2. Find the unknown sides or angles of the given congruent triangles.**

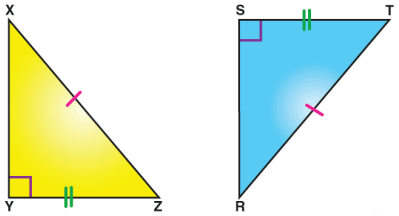


**3. Prove the congruence of these triangles. Also state the property that is applied to prove the congruence.**

a)




b)



| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 1** **Week:** 5 **Lesson Plan:** 7

**Unit Name:** Surface Area and Volume **Topic:** Revision **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Surface Area and Volume”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Surface Area and Volume”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building: (32 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up: (5 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment: (0 min)**

N/A

**Homework: (2 min)**

Revise the classwork.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

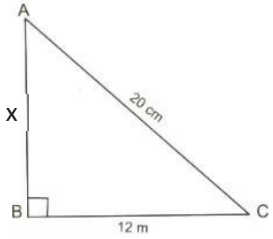
| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

# Worksheet

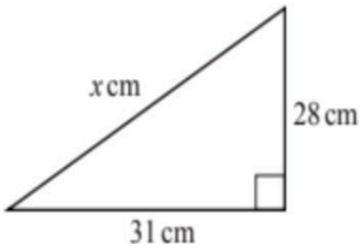
**Name: _____** **Date: _____**

**1. Find the value of the unknown side in the following right-angled triangles.**

a)




b)




**2. A ladder is leaning against a vertical wall. If the base of the ladder is 10 m away from the wall and the ladder reaches a height of 12 m, find the length of the ladder.**

3. **A pizza with a radius of 12 cm and a slice of pizza that forms a central angle of $45^0$. What is the arc length of a slice of pizza?**

4. **The minute hand of a clock is 10 cm long, and it moves through an angle of 120 degrees. What is the area of the sector it covers?**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 1

**Unit Name:** Surface Area and Volume **Topic:** Surface Area of Sphere and Hemisphere **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify sphere and hemisphere and how to calculate their surface area.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook pages 167 - 169

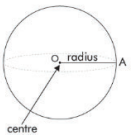
**Teaching & Learning Activities:**

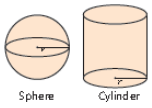
**Opening Activities/Warm-up:** **(8 mins)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Ask students about their previous day homework. Ask students: Do you know about sphere and hemisphere? What is the difference between circle and sphere? Ask students to give examples of objects from their real-life that are of sphere shape or hemisphere shape. Take their responses and appreciate them for their correct response. Recall with them the objects that are of sphere shape in their surroundings like ball, globe, football etc.

**Main Activities/Concept Building:** **(22 min)**

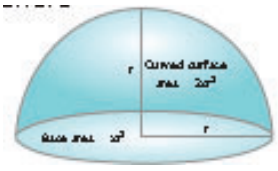
Tell students today that we will learn to identify sphere and hemisphere and how to calculate their surface area. Draw a sphere on the board and tell them that a sphere is a solid round figure that is generated by the rotation of a circle around a fixed point. The fixed point is the centre of the sphere and the distance from centre to outer surface of the sphere is radius of the sphere. Tell the students that to look at the figure where O is the centre and OA represents the radius of the sphere. Ask students: Do you know how we calculate the surface area of the sphere? Take their responses and tell them that a Greek mathematician Archimedes found that the surface area of a sphere is equivalent to the curved surface area of a cylinder with the identical radius as the sphere, where the height of the cylinder is equal to the diameter of the sphere. Tell them to look at the cylinder and sphere, where r is the radius of both spheres and a cylinder and h is equal to 2r. Explain to them that the area of a sphere and the area of the curved surface of a cylinder are equal, which is $4\pi r^2$.




Instruct students to open their textbook page 169 and learn more about it. Instruct them to read the statement of the worked example 1 and tell what is given and what we have to find. Take their responses and tell them that radius of the solid sphere is given that is 3.5 m and we have to find the surface area of the sphere. Solve the example step by step on the board and explain each step to them. For more clarification, solve the worked example 2 step by step on the board and encourage the students to ask questions if they have any confusion.

Tell students as hemisphere is half of the sphere so we get the formula to find the surface area of the hemisphere by dividing surface area of the sphere by 2, that is $\frac{1}{2}(4\pi r^2) = 2\pi r^2$. Explain them the total surface area of the hemisphere = curved surface area + base area. As the base of the hemisphere is circular in shape, use the area of the circle that is $\pi r^2$. Tell them the total surface area of a hemisphere is $3\pi r^2$. Instruct students to read the statement of the worked example 3 and tell what is given and what we have to find. Take their responses and tell them that a hemispherical bowl has a diameter of 16.8 cm is given and we have to find the curved surface area of the bowl. Solve the example step by step on the board and explain each step to them. Encourage the students to ask questions if they have any confusion.



**Sum Up:** **(3min)**

Sum up the lesson by retelling students about how to calculate the surface area of a sphere and hemisphere. Also explain the “Note to Remembers” given at page 168 of their textbook.

**Assessment:** **(5 min)**

To assess students' understanding ask them how we can calculate the surface area of sphere and hemisphere.

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Homework:** **(2 min)**

Revise the class work.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 2

**Unit Name:** Surface Area and Volume **Topic:** Surface Area of Sphere and Hemisphere **Date**: ____

**Objective(s):**

**At the end of this period, the students will be able to:**

Calculate the surface area of sphere and hemisphere.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 171

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(8 mins)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask students about their previous day homework. Ask students: what is the difference between a sphere and a hemisphere? What is the formula to find the area of the sphere? What is the formula to find the area of the hemisphere? Take their responses and appreciate them for their correct response.

**Main Activities/Concept Building:** **(22 min)**

Tell students today that we will calculate the surface area of sphere and hemisphere. Recall and write the formulae to find the area of a sphere and a hemisphere. Emphasize the concepts of radius, diameter, and the distinction between a complete sphere and a hemisphere. Instruct students to open their textbook page 171 and read the statement of the Q1(a) of the “Learning check 8.3”. Ask them to tell what is given and what we have to find. Then draw a sphere with radius 4.2 and solve it step by step on the board. Ask students to solve the question again in their notebook. For more clarification, ask them to solve Q1(b, c) for surface area in their notebook and ask questions if they have any confusion.

**Activity:**

Divide the class into small groups. Provide each group with spherical objects. Instruct students to measure the radius and diameter of the objects using rulers. Have them discuss and determine whether the objects are spheres or hemispheres. Ask each group to choose one object and calculate its surface area. Encourage collaboration and discussion within the groups. Groups should use the whiteboard to show their calculations and explain their reasoning. Invite each group to present their findings to the class. Emphasize the through process, problem-solving strategies, and any challenges they encountered. Encourage questions and discussions among groups. Lead a class discussion on the similarities and differences between the groups' results. Discuss any misconceptions and clarify concepts as needed. Ask students to reflect on what they learned through the activity.

**Sum Up:** **(3min)**

Sum up the lesson by recalling with students how we can calculate the surface area of sphere and hemisphere by using formula.

**Assessment:** **(5 min)**

To assess students ' understanding ask them to solve for surface area of “Pause and Try” given at page 171 of their textbook.

**Homework:** **(2 min)**

Solve for surface area of Q2, Q3 and Q5 of “Learning check 8.3” given at page 171 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 3

**Unit Name:** Surface Area and Volume **Topic:** Volume of Sphere and Hemisphere **Date**:____

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify how to calculate the volume of sphere and hemisphere.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook pages 170 - 171

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

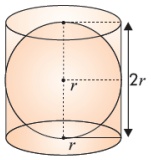
Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask students about their previous day homework. Ask students: How to find the surface area of a sphere and hemisphere? Take their responses and call a student to the front of the class and ask him/her to find the surface area of sphere with radius 8 cm. Instruct the rest of the class to check whether he /she is correct or not. Appreciate for their correct response.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will learn how to calculate the volume of sphere and hemisphere. Begin the lesson by asking students if they know how to find the volume of a sphere and a hemisphere? Allow some students to give answers or share their ideas. After taking their responses and tell them that if the radius of a sphere is given, then we have to find the volume of any sphere by using the formula given below.



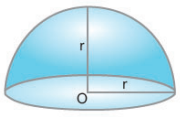

Volume of a sphere = V = $\frac{4}{3}\pi r^3$

Explain them an experiment can illustrate that a sphere's volume is two-thirds that of a cylinder sharing the same radius and a height equal to the diameter. Tell them insert the sphere into the cylinder, fill it with water, and then remove the sphere. Observe that the remaining water in the cylinder that will be equivalent to one-third of its total capacity. Explain to them by this experiment we can say that the volume of the sphere is two-third of the volume of the cylinder.

Volume of a sphere = $\frac{2}{3}$ (volume of a cylinder) = $\frac{2}{3}(\pi r^2 h) = \frac{2}{3} \times \pi r^2(2r) = \frac{4}{3}\pi r^3$

Instruct students to open their textbook page 170 and learn more about it. Instruct them to read the statement of the worked example 1 and tell what is given and what we have to find. Take their responses and tell them that radius of the spherical tank is given that is 2.5 m and we have to find the capacity of the water tank. Solve the example step by step on the board and explain each step to them. For more clarification, solve the worked example 2 step by step on the board and encourage the students to ask questions if they have any confusion.

Tell them that volume of a hemisphere is half of the volume of a sphere that can be written as:




Volume of a hemisphere = $\frac{1}{2} \times \frac{4}{3}\pi r^3 = \frac{2}{3}\pi r^3$

Instruct students to read the statement of the worked example 3 and tell what is given and what we have to find. Take their responses and tell them that a radius of the igloo house is 3.5 m is given and we have to find the volume of the hemispherical igloo house. Solve the example step by step on the board and explain each step to them. Encourage students to ask questions if they have any confusion.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students how to find the volume of a sphere and hemisphere by using formula.

**Assessment:** **(5 min)**

To assess students' understanding ask them how we can calculate the volume/capacity of sphere and hemisphere.

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Homework:** **(2 min)**

Revise the classwork.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 4

**Unit Name:** Surface Area and Volume **Topic:** Volume of Sphere and Hemisphere **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Calculate the volume of sphere and hemisphere.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 171, Spherical and hemispherical objects shape cards

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask students about their previous day homework. Ask students to tell the formula to find the volume of the sphere and hemisphere. Take their responses and then recall with students the formula of finding the volume of sphere and hemisphere by writing formula on the board.

**Main Activities/Concept Building: (25 min)**

Tell students today that we will calculate the volume of sphere and hemisphere. Recall key concepts and formulas for finding the volume of spheres and hemispheres. Connect the lesson to real-world applications, such as the volume of sports balls, containers, etc. Emphasize the concepts of radius, diameter, and the distinction between a complete sphere and a hemisphere. Instruct students to open their textbook page 171 and read the statement of the Q1 (a) of the “Learning check 8.3”. Ask them to tell what is given and what we have to find. Then draw a sphere with radius 4.2 and tell them that we have to find the volume of the given sphere and solve it step by step on the board. Ask students to solve the question again in their notebook. For more clarification, ask them to solve Q1 (b, c) for volume in their notebook and ask questions if they have any confusion.

**Activity:**

Divide the class into small groups, ensuring that each group has a mix of abilities and strengths. Provide each group with spherical and hemispherical objects shape cards. Ask each group to choose two cards one of sphere and the other one is of hemisphere and calculate its volume. Encourage collaboration and discussion within the groups. Invite each group to present their findings to the class. Emphasize the thought process, problem-solving strategies, and any challenges they encountered. Encourage questions and discussions among groups. Discuss any misconceptions and clarify concepts as needed. Ask students to reflect on what they learned through the activity.

**Sum Up: (3min)**

Sum up the lesson by recalling with students how we can calculate the surface area of sphere and hemisphere by using formula.

**Assessment: (5 min)**

To assess students ' understanding ask them to solve for volume of “Pause and Try part a” given at page 171 of their textbook.

**Homework: (2 min)**

Solve for volume/capacity of Q2, Q3 and Q4 of “Learning check 8.3” given at page 171 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 5

**Unit Name:** Surface Area and Volume **Topic:** Surface Area of a Pyramid **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify square pyramid and how to calculate its surface area.

**Resource Material:**

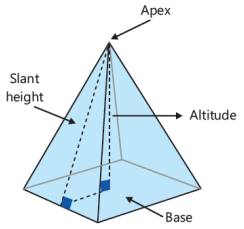
Chalk/Marker, White/Blackboard, Textbook pages 172, 173 and 175

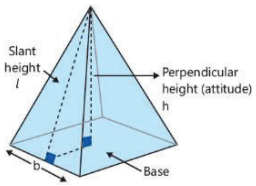
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 mins)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Ask students about their previous day homework. Draw a square pyramid on the board and ask students: Do you know about the drawn shape? Take their responses and tell them that the given shape is pyramid that has four triangular faces and one square face. Then ask students: Do you know what is meant by surface area of any shape? Take their responses and then recall with them surface area is the amount of space covering the outside of 3-dimensional solid or object.

**Main Activities/Concept Building:** **(25 min)**




Tell students today that we will learn about square pyramid and how to calculate its surface area. Begin the lesson by drawing a square pyramid on the board and tell them that a square pyramid has one square base and 4 triangular faces that meat at common point called apex. The perpendicular distance from the base to the vertex is known as the height or altitude of the pyramid. The distance from the apex to the base of the triangular lateral faces is known as the slant height. Draw and explain about each part of the square pyramid. Tell students surface area of the square pyramid is the total surface area of its four triangular lateral faces and one square base. Tell them to imagine a square pyramid with a base side length of 'b' and the slant height (height of the triangular sides) is '$l$', and the perpendicular height or altitude of the pyramid is 'h'. Explain them each triangular side is a triangle with a slant height of '$l$' and a base side length of 'b'. Tell them the area of each triangular side can be calculated by using the formula as:

Area of each lateral (triangular) face = $\frac{1}{2}$ × base × slant height = $\frac{1}{2}$ × b × l

As we have 4 triangular faces so it can be written as:

Total surface area of lateral (triangular) faces = 4 × ($\frac{1}{2}$ × b × l) = 2 × b × l = 2bl

Now explain them the base area of a square in the pyramid as:

Base (Square) area of a pyramid = b × b = b2.

Tell them that the surface area of the square pyramid is the sum of area of square base and surface area of 4 lateral triangular faces.

Total surface area of a pyramid = Area of each lateral (triangular) face + Base (Square) area of a pyramid

= 2bl + b2

Tell the students that if the height and base length are given, we can find the slant height as follows:

Slant height = l = $\sqrt{\frac{b^2}{4} + h^2}$

Instruct students to open their textbook page 173 and read the statement of the worked example 1 and tell what is given and what we have to find. Take their responses and tell them that Students are making a square pyramid-shaped wooden model for their project with square base of 50 cm and the slant height is 72 cm, and we have to find how much wooden sheet they used to cover all the sides. Solve the example step by step on the board and explain them to each step. For more clarification, solve the worked example 2 step by step on the board and encourage them to ask questions if they have any confusion.

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Sum Up:** **(3min)**

Sum up the lesson by retelling students how to find the surface area of a pyramid. Also explain the "Note to Remember" given at page 172 of their textbook.

**Assessment:** **(5 min)**

To assess students' understanding by asking them to draw a square pyramid in their notebooks and label its parts and write the formula to find the surface area of square pyramid.

**Homework:** **(2 min)**

Revise the classwork.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 6

**Unit Name:** Surface Area and Volume **Topic:** Surface Area of a Pyramid **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Calculate the surface area of square pyramid.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 175 and 176, square pyramid model made up of cardboard or paper

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask students about their previous day homework. Ask students: what is meant by a pyramid? What is meant by apex? How to derive the formula to find the total surface area of a pyramid? Take their responses and call a student to the front of the class and ask him/her to draw a pyramid and write the formula to find the total surface area of a pyramid. Instruct the rest of the class to check whether he /she is correct or not. Recall with them the formula to find the surface area of the square pyramid.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will calculate the surface area of square pyramid. Recall key concepts and formulas for finding the total surface area of a pyramid. Instruct students to open their textbook page 175 and read the statement of the Q1 of the “Learning check 8.4”. Ask them to tell what is given and what we have to find. Take their responses and tell them that square pyramid are given and we have to find the surface area of the given pyramids. Assign one part to each student and instruct them to find the surface area in their notebooks. Walk around, monitor their working and guide them where required. After completing each student show their working to the whole class and discuss with them their common mistakes and correct them where needed. Appreciate them for their active participation in class.

**Activity:**

Divide students into small groups according to the strength. Provide each group a square pyramid model made up of cardboard or paper. Instruct students to find the surface area of the shape provide to them by breaking it into its net and find the area of each surface separately. Then calculate the total surface area.

Encourage discussion within the groups, ensuring that all members actively participate in solving the problems. After a set time, ask each group to present their solutions and explain their reasoning. Allow other groups to ask questions or provide feedback.

**Sum Up:** **(3min)**

Sum up the lesson by retelling the students how to calculate the surface area of the square pyramid by using formula.

**Assessment:** **(5 min)**

To assess students ' learning ask them to solve Q4 (a) of “Learning check 8.4” given at page 176 of their textbook in their notebooks.

**Homework:** **(2 min)**

Solve for surface area of a pyramid of Q5 and Q6 of “Learning check 8.4” given at page 176 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 1 **Lesson Plan:** 7

**Unit Name:** Surface Area and Volume **Topic:** Volume of a Pyramid **Date:** _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify how to calculate the volume of square pyramid.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook pages 174 – 175

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

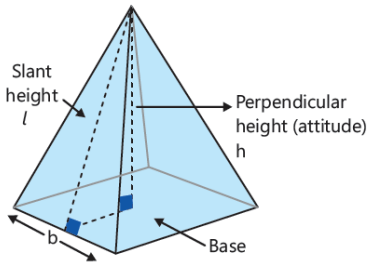
Say, "Assalaamu Alaikum" and start with the name of Allah.

Ask students: How are you? Encourage them to say, "Alhamdulillah".

Ask students about their previous day homework. Ask students: What is meant by volume of any shape? Take their responses and tell them that volume is the space occupied by any shape or object. Draw a square pyramid on the board and recall with students their base, slant height or altitude by labeling it.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will learn how to calculate the volume of square pyramid. Begin the lesson by asking students if they know what is meant by volume of a pyramid? How can we find the volume of a pyramid shape? Allow some students to give answers or share their ideas. After taking their responses and tell them that as we know that the volume is the space occupied by any object. Explain them volume of a square pyramid is the space occupied by its square base and its four triangular lateral surfaces. Tell them if we have a square pyramid whose base's length, or the length of one side of the square, is 'b' and the slant height (lateral face height) is '$l$' and the altitude or height of the pyramid is 'h'. Then we can drive the formula that can be used to determine this square pyramid's volume is as follows:




Volume of a square pyramid = $\frac{1}{3}$ × base area × perpendicular height (altitude) = $\frac{1}{3} \times b^2 \times h$

Instruct students to open their textbook page 174 and read the statement of the worked example 1 and tell what is given and what we have to find. Take their responses and tell them that perfume bottle is given that is of square pyramid shape and we have to find the capacity of the bottle if its base length is 15 cm and perpendicular height or altitude is 8cm. Solve the example step by step on the board and explain them to each step. For more clarification, solve the worked example 2 step by step on the board and encourage them to ask questions if they have any confusion.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students how to find the volume/capacity of the square pyramid by using formula.

**Assessment:** **(5 min)**

To assess students' understanding by asking them to draw a square pyramid in their notebooks and label its parts and write the formula to find the volume of square pyramid.

**Homework:** **(2 min)**

Revise the classwork.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 1

**Unit Name:** Surface Area and Volume **Topic:** Volume of a Pyramid **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Calculate the volume of square pyramid.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 176, cardboard or paper

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask students about their previous day homework. Ask students: define the volume of a pyramid and write its formula? Take their responses and call a student to the front of the class and ask him/her to draw a pyramid and write the formula to find the volume of a pyramid. Instruct the rest of the class to check whether he /she is correct or not. Appreciate their active participation.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will calculate the surface area of square pyramid. Recall key concepts and formulas for finding the volume/capacity of a pyramid. Instruct students to open their textbook page 176 and read the statement of the Q2 of the “Learning check 8.4”. Ask them to tell what is given and what we have to find. Take their responses and tell them that base length and altitude of the square pyramid are given and we have to find the volume of the given pyramids. Assign one part to each student and instruct them to find the surface area in their notebooks. Walk around, monitor their working and guide them where required. After completing each student show their working to the whole class and discuss with them their common mistakes and correct them where needed. Appreciate them for their active participation in class.

**Activity:**

Divide students into small groups according to the strength. Provide cardboard or paper to each group and instruct them to construct a square pyramid by using the cardboard or paper. After constructing measure the length of it base and slant height and then find the volume of the square pyramid by using formula.

Encourage discussion within the groups, ensuring that all members actively participate in solving the problems. After a set time, ask each group to present their solutions and explain their reasoning. Allow other groups to ask questions or provide feedback. Appreciate them for their good work and discuss with them about their common mistakes.

**Sum Up:** **(3min)**

Sum up the lesson by retelling the students how to calculate the volume/capacity of the square pyramid by using formula.

**Assessment:** **(5 min)**

To assess students ' understanding ask them to solve “Pause and Try” given at page 175 of their textbook in their notebooks.

**Homework:** **(2 min)**

Solve Q3, Q4 (b), Q5 for capacity and Q6 for volume of “Learning check 8.4” given at page 176 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 2

**Unit Name:** Surface Area and Volume **Topic:** Surface Area of a Cone **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify cone and how to calculate its surface area.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook pages 176 – 179

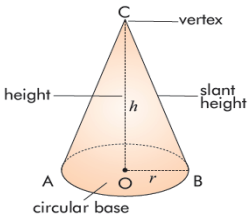
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Ask students about their previous day homework. Draw a cone on the board and ask students do you know about the drawn shape and their properties? Take their responses and then recall with them that it is a 3-dimensional solid called cone with one curved and one flat face.

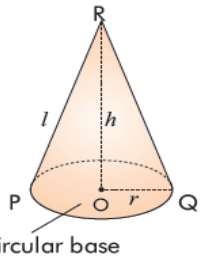
**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will learn about cone and how to calculate its surface area. Begin the lesson by asking students: What does mean of surface area of the cone? Take their responses and tell them that the surface area of a cone refers to the total area of all its outer surfaces, including the curved surface and the base. Draw a cone on the board and point out towards the corner C of the cone and tell them that it is called the vertex of the cone. The distance from vertex of cone to base of the cone is height of the cone and the distance AC is the slant height of the cone. Tell them that we can calculate the slant height of the cone by using Pythagoras theorem. Calculate the slant height and explain it to them.




Now explain to students that surface area of the cone is the sum of the area of the curved surface and area of the base. Tell them about the derivation of the formula to find the area of a curved surface, which can be written as:

Area of the curved surface = $\frac{1}{2}$ × perimeter of base × slant height = $\frac{1}{2}$ × $(2\pi r)$ × $l$ = $\pi$rl




Now tell them about the base area of a right circular cone that is equal to $\pi r^2$. Now tell them as we know the total surface area is the sum of curved surface are and the base area of the right circular cone.

Total surface area of a cone = $\pi rl + \pi r^2 = \pi r\ (l + r)$

Instruct students to open their textbook page 178 and read the statement of the worked example 1 and tell what is given and what we have to find. Take their responses and tell them that radius and height of the right circular cone is given and we have to find the slant height and total surface area of the cone (part 'a' and part 'b'). Solve the example step by step on the board and explain them to each step. For more clarification, solve the worked example 2 for surface area step by step on the board and encourage them to ask questions if they have any confusion.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students about how to calculate the surface area of the cone by using formula. Also explain the "Note to Remember" given at page 177 of their textbook.

**Assessment:** **(5 min)**

To assess students ' understanding by asking them to tell how we can find he slant height of the right circular cone and how we can drive the formula to find the surface area of the cone.

**Homework:** **(2 min)**

Revise the classwork.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 3

**Unit Name:** Surface Area and Volume **Topic:** Surface Area of a Cone **Date**: _____

**Objective(s):**

**At the end of this period, the students will be able to:**

Calculate the surface area of a cone.

**Resource Material:**

Chalk/Marker, White/Blackboard, Cone-shaped object or model, Ruler/measuring, Textbook page 179

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(8 mins)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Ask students about their previous day homework. Ask students: what is meant by a cone? What is meant by vertex of the cone? How to derive the formula to find the total surface area of a cone Take their responses and call a student to the front of the class and ask him/her to draw a right circular cone and write the formula to find the total surface area of a cone. Instruct the rest of the class to check whether he /she is correct or not. Recall with them the formula to find the surface area of the cone.

**Main Activities/Concept Building:** **(25 min)**

Tell students today that we will calculate the surface area of cone. Recall key concepts and formulas for finding the total surface area of a pyramid. Instruct students to open their textbook page 179 and read the statement of the Q1 of the “Learning check 8.5”. Ask them to tell what is given and what we have to find. Take their responses and tell them that cones are given and we have to find the surface area of the given cones. Assign one part to each student and instruct them to find the surface area in their notebooks. Walk around, monitor their working and guide them where required. After completing each student show their working to the whole class and discuss with them their common mistakes and correct them where needed. Appreciate them for their active participation in class.

**Activity:**

Divide the participants into small groups and provide each group with a cone-shaped object or model. Instruct each group to measure the radius and slant height of their cone using rulers or measuring tapes. Once the measurements are recorded, instruct them to find the surface area of the cone. Have each group share their findings and discuss any challenges they faced during the calculations. Encourage discussion within the groups, ensuring that all members actively participate in solving the problems. After a set time, ask each group to present their solutions and explain their reasoning. Allow other groups to ask questions or provide feedback. Appreciate them for their good work and discuss with them about their common mistakes.

**Sum Up:** **(3min)**

Sum up the lesson by recalling with students the steps to calculate the surface area of the cone by using formula.

**Assessment:** **(5 min)**

To assess students ' understanding by asking them to solve “Pause and Try” given at page 178 for surface area of the cone.

**Homework:** **(2 min)**

Solve Q3, Q4, Q5 and Q6 (a) of “Learning check 8.5” given at page 179 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 4

**Unit Name:** Surface Area and Volume **Topic:** Volume of a Cone **Date:**_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Identify how to calculate the volume of cone.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook pages 174 – 175.

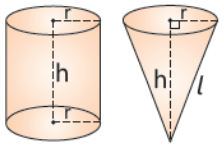
**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(8 mins)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Ask students about their previous day homework. Ask students: how can we calculate the surface area of a cone? Take their responses and call a student to the front of the class and ask him/her to draw a cone with radius is 6 cm and slant height is 10 cm and ask him/her to find the surface area of a cone. Instruct the rest of the class to check whether he /she is correct or not. Appreciate them for their correct work and actively participating.

**Main Activities/Concept Building:** **(22 min)**

Tell students today that we will learn how to calculate the volume/capacity of the cone. Begin the lesson by asking students if they know what is meant by the volume of a cone? Allow some students to give answers or share their ideas. After taking their responses and tell them that the amount of space that a cone occupies is known as its volume. Tell students to find the volume of the cone we are going to perform an experiment. Bring a cylinder and a cone with same height and radius in class. Now fill the cone with water and pour that water in the cylinder. Again fill the cone with water and pour it into cylinder. We can see that when we pour third time cone water into cylinder, the cylinder filled completely with water. Ask student: what does it mean? Take their responses and appreciate if someone gives the right answer. Then tell them that it means the volume of the cone is one third of the volume of the cylinder.




Volume of a right circular cone = $\frac{1}{3}$ (volume of the cylinder)

$= \frac{1}{3}(\pi r^2 h)$

Derive the formula for finding the volume of the cone and explain each step to them. Explain to them that we use cubic units like $cm^3$, $m^3$, and so on to measure the volume of a cone.

Instruct students to open their textbook page 178 and read the statement of the worked example 1 and tell what is given and what we have to find. Take their responses and tell them that radius and height of the right circular cone is given and we have to find the volume of the cone (part 'c'). Solve the example step by step on the board and explain them to each step. For more clarification, solve the worked example 2 "part b" step by step on the board and encourage them to ask questions if they have any confusion.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students about how to find the volume of the cone by using formula with the help of examples.

**Assessment:** **(5 min)**

To assess students ' understanding ask them derive the formula to find the volume of the cone and explain it.

**Homework:** **(2 min)**

Revise the classwork.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 5

**Unit Name:** Surface Area and Volume **Topic:** Volume of a Cone **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Calculate the volume of cone.

**Resource Material:**

Chalk/Marker, White/Blackboard, Cone-shaped object or model, Ruler/measuring, Textbook page 179

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Ask students about their previous day homework. Ask students: How can we find the volume of a cone? Take their responses and call a student to the front of the class and ask him/her to drive the formula to find the volume of the cone. Ask the rest of the class to check whether he/she doing work correctly or not. Appreciate them for their good work and then recall with them the formula to find the volume/capacity of the cone.

**Main Activities/Concept Building: (25 min)**

Tell students today that we will calculate the surface area of cone. Recall key concepts and formulas for finding the total surface area of a pyramid. Instruct students to open their textbook page 179 and read the statement of the Q2 of the “Learning check 8.5”. Ask them to tell what is given and what we have to find. Take their responses and tell them that radius and slant height of the cones are given and we have to find the volume of the cones. Assign one part to each student and instruct them to find the volume in their notebooks. Walk around, monitor their working and guide them where required. After completing each student show their working to the whole class and discuss with them their common mistakes and correct them where needed. Appreciate them for their active participation in class.

**Activity:**

Divide the participants into small groups and provide each group with a cone-shaped object or model. Instruct each group to measure the radius and slant height of their cone using rulers or measuring tapes. Once the measurements are recorded, instruct them to find the volume of the cone. Have each group share their findings and discuss any challenges they faced during the calculations. Encourage discussion within the groups, ensuring that all members actively participate in solving the problems. After a set time, ask each group to present their solutions and explain their reasoning. Allow other groups to ask questions or provide feedback. Appreciate them for their good work and discuss with them about their common mistakes.

**Sum Up: (3min)**

Sum up the lesson by recalling with students the steps to calculate the volume/capacity of the cone by using formula.

**Assessment: (5 min)**

To assess students ' understanding by asking them to solve “Pause and Try” given at page 178 for volume of the cone.

**Homework: (2 min)**

Solve Q6 (b) of “Learning check 8.5” given at page 179 of their textbook

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 6

**Unit Name:** Surface Area and Volume **Topic:** Sum Up and Unit Check **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 8 by solving Q1-8 of Unit Check Exercise.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook pages 180 and 181

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.
Ask students: How are you? Encourage them to say, “Alhamdulillah”.
Tell students that they are going to revise all the concepts of the Unit “Surface area and Volume”.
Ask them the different questions that are related to “Surface area and Volume”.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Have students open page 180 and 181 of their textbooks. Ask them to solve Q1 to Q6 of “Unit Check 8”. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Sum Up:** **(3 min)**

Sum up the lesson by repeating the important points given in Sum-Up of the unit given at page 180.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Solve the Q7 and Q8 of “Unit Check 8” given at page 181 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 2 **Lesson Plan:** 7

**Unit Name:** Surface Area and Volume **Topic:** Sum Up "work with math" **Date**:_____

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 8 by solving Q9-13 of Unit Check Exercise and by completing "work with math" activity

**Resource Material:**

Chalk/Marker, White/Blackboard, Cardboard, Scissors, Pins, Markers, textbook pages 182

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah.
Ask students: How are you? Encourage them to say, "Alhamdulillah".
Tell students that they are going to revise all the concepts of the Unit "Surface area and Volume".
Ask them the different questions that are related to "Surface area and Volume".

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Have students open page 182 of their textbooks. Ask them to solve Q9 to Q11 of "Unit Check 8". Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Activity 2:**

Tell students today, we will be performing a math project (work with math).

- Work in pairs.
- Use cardboard and cut it in circular pieces and straight pieces (which will act as radial segments).
- Mention the radius for each circle.
- One member from each pair will show an angle to the other and the other member will calculate the sector area or arc length accordingly.

**Sum Up:** **(3 min)**

Sum up the lesson by repeating the important points of the whole unit "Surface area and Volume".

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Solve the Q12 and Q13 of "Unit Check 8" given at page 182 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 3 **Lesson Plan:** 1

**Unit Name:** Data Management and Probability **Topic:** Data and its representation **Date**:

**Objective(s):**

**At the end of this period, the students will be able to:**

Recognise the difference between discrete, continuous, grouped and ungrouped data.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 183 – 185

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(8 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Ask students about previous day homework. Have student’s open textbook at page 183. Quickly recall the concepts related to questions given in rapid recall. Then ask them to solve those questions. Read the opening page question and tell them that we will be able to solve it after learning about the concepts of the unit.

(***Note for teachers***: *The sections “Think out of the box”, “Talk over and write” and “Technology corner” are supplementary exercises. These can also be given to students who finish their work quickly or are fast learners*.)

**Main Activities/Concept Building:** **(22 min)**

Before the main concept, tell them briefly about the unit outline and its real-life relevance. Tell the students today we will recognise the difference between discrete, continuous, grouped and ungrouped data. Ask them: What is meant by data? Take their responses and tell them that the information collected in the form of numbers, words, figures, facts, etc. is called data. Explain them when we present this data in a meaningful way, it is known as data handling. Tell them that raw data is the information initially collected without any organization or arrangement and the process of collecting information is called data collection. Explain them there are many ways to collect data like observation, interviews, questionnaires, newspapers, magazines and internet. Ask students: What is the difference between ungrouped and grouped data? Tell the students that ungrouped data consists of individual, raw observations or values. Write examples on the board like a list of individual exam scores for a class, such as 62, 72, 75, 82, 88, 68, etc. Now tell the students that grouped data involves organizing individual observations into groups or intervals. Write examples on the board like exam scores grouped into intervals like 60-69, 70-79, 80-89, etc., with corresponding frequencies. Ask them: What is the difference between discrete and continuous data? Tell the students that the term "discrete" means "different" or "separate." Discrete data refers to values or quantities represented by an integer or whole numbers. Explain to them that discrete data values are countable and cannot be divided into further parts. Write examples on the board like the number of animals in a zoo, the number of students in a class, etc. On the other hand, tell them that a value or quantity that can be expressed as a fraction or decimal numbers correspond to continuous data. Explain them continuous data cannot be counted and take any value within the range. Write examples on the board like height of students, volume of a container, etc. Instruct students to open their textbook page 184 and 185 and learn more about data and its types.

**Sum Up:** **(3min)**

Sum up the lecture by retelling about the difference between ungrouped and grouped data, discrete and continuous data.

**Assessment:** **(5min)**

To assess students’, understanding ask them to explain the difference between grouped and ungrouped data, continues and discrete data with the help of examples.

**Homework:** **(2 min)**

Solve Q1 of “Learning Check 9.1”given at page 185 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 3 **Lesson Plan:** 2

**Unit Name:** Data Management and Probability **Topic:** Data and its representation **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Select and justify the most appropriate graph(s) for a given data set.

**Resource Material:**

Chalk/Marker, White/Blackboard, graph/chart, Textbook page 185

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask the students: How are you? Encourage them to say, “Alhamdulillah”. Ask students about their previous day homework. Begin the lesson by asking students: Do you know about different types of graph and how we can represent data on those graphs. Take their responses and appreciate them for their correct responses?

**Main Activities/Concept Building:** **(25 min)**

Tell the students today we will learn how we select and justify the most appropriate graph(s) for a given data set. Ask them: Do you know how we can select that we draw a bar graph, pie graph or line graph for the given data set? Take their responses and instruct students to open their textbook page 185. Tell students that the most appropriate type of graph or chart depends on the nature of the data. Explain them every type of chart has its own characteristics. First tell the students about pictograph that a pictograph is suitable when you have to show the data in an attractive and lively way. Explain to them that it is the most basic chart that we use at the beginning of our introduction to graphs. Tell them that bar charts are commonly used to compare the values of different categories or groups, making it easy to visualize patterns, and variations in the data. They are effective for presenting categorical data and are often used in various fields such as business, economics, statistics, and more. Tell the students that multiple bar charts are effective tools for visually comparing data across different variables or categories, making it easier to identify variations within and between groups. Explain them line graph is suitable when we want to show data that is changing over time for example, the rate of the dollar, the temperature of a city, etc. Tell students that pie charts are useful for providing a visual representation of the distribution of a set of data and are particularly effective when there are a small number of categories. For example, the percentage of shares among business partners, percentage of profits from different products, etc. Explain each type of graph with example to students and explain how we can choose graph for the specific type of data. Encourage students to ask questions if they have any confusion.

**Activity:**

Present different data sets on the whiteboard. Ask students to discuss in groups and decide which type of graph would be most appropriate for each data set. Have each group justify their choice by considering the nature of the data and the information. Encourage discussion within the groups about the reasoning behind their choices. Encourage groups to review each other's graphs to ensure accuracy and clarity. This promotes collaboration and provides an opportunity for constructive feedback.

**Sum Up:** **(3min)**

Sum up the lecture by retelling about the best selection of chart according to data representation.

**Assessment:** **(5min)**

To assess students based on their group presentations, contributions to class discussions, and their ability to justify graph choices.

**Homework:** **(2 min)**

Revise the class work.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 3 **Lesson Plan:** 3

**Unit Name:** Data Management and Probability **Topic:** Range **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Calculate range, for ungrouped data and solve related real-world problems.

**Resource Material:**

Chalk/Marker, White/Blackboard, paper slips, Textbook page 186 – 187, 190 – 191

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Ask students about their previous day homework. Ask students: Do you know about ungrouped data? Take their responses and recall with them that the ungrouped data is the raw data that has just collected from any source or experiment or survey. Give examples to more explanation of ungrouped data.

**Main Activities/Concept Building:** **(25 min)**

Tell the students today we will learn to calculate range, for ungrouped data and solve related real-world problems. Ask them: Do you know about measure of dispersion? Take their responses and tell them that the degree to which numerical data is likely to vary from an average value or the variation that exist between data values is known as dispersion. Tell them that measures of dispersion that we commonly used in our daily life are range, variance and standard deviation. Tell them that today we will learn about range. Ask them: Do you know what is meant by range? Take their responses and tell them that if we have data set then the difference between maximum and minimum value of the data is called range.

Explain them the formula to find the range of the data as: Range = R =$X_{max} - X_{min}$. Where $X_{max}$the greatest value of the data set and $X_{max}$ is the smallest value of the data set.

Instruct students to open their textbook page 186 and learn more about range. After this instructs students to read the statement of the worked example 1 and tell what is given and what we have to find. Take their responses and tell them that data is about number of students from grade 1 to VIII that participated in mathematics competition. Write the data set on the board that is "8, 5, 6, 5, 9, 10, 7, 8". Instruct students to observe and tell about maximum and minimum value of the data set, then tell them that 10 is the greatest and 5 is the minimum data value.

Range = R = $X_{max} - X_{min}$ = 10 – 5 = 5

Solve example step by step on the board and explain each step to them. Encourage students to ask questions if they have confusion. For more clarification, solve the worked example 2 step by step on the board and explain each step to them.

**Activity:**

Instruct students to open their textbook page 190 and 191. Ask students to solve Q1 and Q2 for finding the range of the data. Walk around and check their work and guide them where required. Appreciate them for their good work.

**Sum Up:** **(3min)**

Sum up the lecture by retelling students about range and its uses in our daily life.

**Assessment:** **(5min)**

To assess students' learning, ask them solve "Pause and Try" given at page 186 of their textbook.

**Homework:** **(2 min)**

Solve Q3 to Q6 for finding range of "Learning check 9.2" given on pages 190 and 191 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 3 **Lesson Plan:** 4

**Unit Name:** Data Management and Probability **Topic:** Variance for ungrouped data **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Calculate variance for ungrouped data and solve related real-world problems.

**Resource Material:**

Chalk/Marker, White/Blackboard, graph/chart, Textbook page 187 – 188, 190 – 191

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Ask students about their previous day homework. Ask students: What is the measure of dispersion? What is meant by the range? How we can find the range of any given data set? Take their responses and write the data set 13, 9, 6, 20, 15, 21 on the board and instruct to find the range of the given data.

**Main Activities/Concept Building:** **(25 min)**

Tell the students today we will learn to calculate variance for ungrouped data and solve related real-world problems. Ask them: Do you know about variance? Take their responses and instruct students imagine we have a set of numbers, like the scores of your classmates in a test of mathematics. Variance is like a measure of how much those scores spread out from the average score. If all the scores are pretty close to the average, the variance will be small. This means most people did about the same on the test. But if some scores are very higher or very lower than the average, the variance will be bigger. This tells us that the scores are spread out more, meaning some people did really well and others didn't do as well. So, variance helps us understand how much the scores differ from each other and from the average. If everyone's scores are the same, the variance is zero. But if there's a big difference between scores, the variance will be higher. Tell students, variance is always positive because it's measuring how far away the scores are from the average, not whether they're above or below it. Explain them variance is usually denoted by $S^2$. Tell them the formula to find the variance of the given data.

Variance = $S^2 = \frac{\sum(x-\bar{x})^2}{n}$

Explain them $\bar{x}$ is the mean $n$ is the total number of data values $x$ stands for each data value. Instruct students to open their textbook page 187 and learn more about variance. Instruct them to open their textbook page 188 and read the statement of the worked example and tell what is given and what we have to find. Take their responses and tell them that the data is about the marks obtained out of 30 by 7 students in a monthly test and we have to find the variance of data. Solve the example step by step on the board and explain them to each step. Encourage the students to ask questions if they have any confusion.

**Activity:**

Instruct students to open their textbook page 190. Ask students to solve Q1 for finding the variance of the data. Walk around, check their work and guide them where required. Appreciate them for their good work.

**Sum Up:** **(3min)**

Sum up the lesson by retelling about variance and how we can calculate variance of the given data set.

**Assessment:** **(5min)**

To assess students’ learning, ask them solve “Pause and Try” given at page 187 of their textbook.

**Homework:** **(2 min)**

Solve Q2, Q3, Q5 and Q6 for finding variance of “Learning check 9.2” given on pages 191 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 3 **Lesson Plan:** 5

**Unit Name:** Data Management and Probability **Topic:** Standard Deviation **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Calculate standard deviation for ungrouped data and solve related real-world problems.

**Resource Material:**

Chalk/Marker, White/Blackboard, graph/chart, Textbook page 189 – 191

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask students about their previous day homework. Ask students: What is meant by variance? How we can calculate the variance of any data set? What is the difference between range and variance? Take their responses and appreciate them for their correct response.

**Main Activities/Concept Building:** **(25 min)**

Tell the students today we will learn to calculate standard deviation for ungrouped data and solve related real-world problems. Ask them: Do you know about standard deviation? Take their responses and instruct the students to open their textbook page 189 and tell them that the standard deviation is also a measure of the dispersion of data values (relative to their mean). Explain them standard deviation is the positive square root of the variance and usually denoted by S. Write the formula to find the standard deviation on the board that is

Standard Deviation = S = $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$

Instruct students to open their textbook page 189 and learn more about standard deviation. Then ask them to read the statement of the worked example and tell what is given and what we have to find. Take their responses and tell them that the data is about the number of plants planted by the 10 groups of grade 8 students and we have to calculate the standard deviation for this data. Solve the example step by step on the board and explain them to each step. Encourage the students to ask questions if they have any confusion.

**Activity:**

Instruct students to open their textbook page 190. Ask students to solve Q1 for finding the standard deviation of the data. Walk around, check their work and guide them where required. Appreciate them for their good work.

**Sum Up:** **(3min)**

Sum up the lesson by retelling about standard deviation and how we can calculate standard deviation of the given data set.

**Assessment:** **(5min)**

To assess students’ learning, ask them solve “Pause and Try” given at page 190 of their textbook.

**Homework:** **(2 min)**

Solve Q2, Q3, Q4 and Q6 for finding standard deviation of “Learning check 9.2” given on pages 191 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 3 **Lesson Plan:** 6

**Unit Name:** Data Management and Probability **Topic:** Frequency Distribution **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Construct frequency distribution tables.

**Resource Material:**

Chalk/Marker, White/Blackboard, graph/chart, Textbook page 191, 192 and 196

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Ask students about their previous day homework. Ask students: What is the difference between grouped and ungrouped data? Ask them to give one example of each data type. Take their responses and appreciate them for their correct answer.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will learn to construct frequency distribution tables for grouped and ungrouped data. Recall with students that the ungrouped data is for raw information or values. Ask them: Do you know about frequency? Take their responses and tell them that the number of times a specific observation occurs in the collected data is called the frequency of that value and to organizing information in the form of table consisting of the observations and the frequency of each observation is called frequency distribution. Tell them that when the observation are tabulated in an ungrouped manner such that each observation of the data shown with its frequency. Instruct students to open their textbook page 191 and read the statement of the worked example and tell what is given and what we have to find. Take their responses and tell them that the marks obtained by 20 students in a mathematics test out of a total of marks 50 are given and we have to construct a frequency distribution table for the given data. Tell them that to construct frequency distribution table, first we draw a table with three columns, marks obtained in first column, tally marks in second column and frequency in the third column. Observe the data as 30 is the lowest value in the given data so we start with 30, write 30 in the first column and write all the obtained marks in first columns and now count the number of times each score has been obtained and put the corresponding tally marks against it. After this count them and write the number in the third column. This gives us the frequency of each score. Solve the example step by step on the board and explain to them each step. Tell students we can construct frequency distribution table for grouped data. A grouped frequency distribution table has class limits, which are intervals. Explain the terms range of the data, class intervals, upper and lower class limit, class boundaries that are used in grouped frequency distribution with examples to students. Then solve the worked example 2 for grouped data and explain each step to them and encourage students to ask questions if they have any confusion.

**Activity:**

Have students open page 196 of their textbooks. Ask them to solve Q1 of “Learning Check 9.3” of their textbooks. Walk around the class, check their work and guide them where required.

**Sum Up:** **(3min)**

Sum up the lesson by retelling students how we can construct the frequency distribution table for ungrouped and grouped data and also explain “Note to Remember” given at page 192 of their textbook.

**Assessment:** **(5min)**

To assess students’ learning ask them to tell the steps to construct frequency distribution table for grouped and ungrouped data.

**Homework:** **(2 min)**

Solve Q2 of “Learning check 9.3” given on page 196 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 3 **Lesson Plan:** 7

**Unit Name:** Data Management and Probability **Topic:** Histogram **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Construct histograms.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 193, 194 and 196

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Ask them about their previous day homework. Begin the lesson by asking them: What is difference between grouped and ungrouped data frequency distribution? What is the difference between upper class and lower-class limit? What is meant by class boundary? What is meant by frequency distribution for ungrouped data? Take their responses and appreciate them for their correct answer.

**Main Activities/Concept Building:** **(25 min)**

Tell the students today we will learn how to construct a histogram. Ask them: Do you know about histogram? Take their responses and tell them that the term "histogram" originates from the Greek words "histos," meaning pole, and "gram," means chart or graph. So we can say that a histogram is a pole chart. A histogram is used to represent data where the class intervals (or boundaries) are taken along the x-axis and the corresponding frequencies are along the y-axis. A histogram is drawn by dividing the range of the given data into smaller intervals or boundaries. Instruct students to open their textbook page 193 and read the statement of the worked example and tell what is given and what we have to find. Take their responses and tell them that data is about the heights (in cm) of 30 new plants planted by grade 8 students during a plantation campaign and we have to construct histogram for this data. First we arrange the given data and construct group frequency distribution table for it. Construct the table and explain each of it to them. After this find the boundaries for each class and write in table. After creating the frequency distribution table, take a graph paper and draw x and y-axis. Label the height of plants in cm along x-axis and number of plants along y-axis. On the horizontal axis, label the lower boundary of each interval, draw a bar extending from the lower value of each interval to the lower value of the next interval. The height of each bar should be equal to its corresponding frequency. Construct the histogram and explain each step to them. Encourage them to ask questions if they have any confusion.

**Activity:**

Have students open page 196 of their textbooks. Ask them to solve Q3 of “Learning Check 9.3” of their textbooks. Walk around the class, check their work and guide them where required.

**Sum Up:** **(3min)**

Sum up the lecture by retelling about the steps of construction of histogram.

**Assessment:** **(5min)**

To assess students’ learning, ask them what is histogram and how we construct a histogram.

**Homework:** **(2 min)**

Solve Q4 and Q7 (for histogram) of “Learning check 9.3” given on pages 196 and 197 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 1

**Unit Name:** Data Management and Probability **Topic:** Frequency Polygon **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Define frequency polygon and the method to construct it.

**Resource Material:**

Chalk/Marker, White/Blackboard, graph/chart, Textbook page 195-197

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Ask them about their previous day homework. Ask students: What is meant by the frequency? What is meant by the frequency distribution? What is meant by class interval and class boundaries? Take their response and recall with students these terms.

**Main Activities/Concept Building:** **(25 min)**

Tell the students today we will learn about frequency polygon and the method to construct it. Ask them: Do you know about polygon? Take their responses and tell them that a polygon is a closed two-dimensional figure made up of straight line segments. These line segments are called sides or edges, and the points where they intersect are called vertices. Polygons can vary in shape and size, depending on the number of sides they have. Tell students a frequency polygon is a graphical representation of a frequency distribution. It is constructed by plotting points representing the frequencies of different values or classes along a number line and then connecting these points with straight lines. Instruct students to open their textbook page 195 and read the statement of the worked example and tell what is given and what we have to find. Take their responses and tell them that data of heights of 50 peoples are given and we have to construct frequency polygon for the given data. Paste a chart paper on the board. Tell students that we construct the frequency polygon by using the following construction steps: First we add two extra classes, one before first class interval and the second is in the last class interval of the same width with 0 frequencies. Next, find the class boundaries for each interval. Find the midpoint (or class mark) for each class. Tell them gather the data and organize it into a frequency distribution table, which includes intervals or classes and their corresponding frequencies. Explain them for each class interval, find the midpoint. Tell them the midpoint is the average of the upper and lower-class limits. If the class interval is (a, b), the midpoint is $\frac{a+b}{2}$. Mark midpoints (class marks) along the x-axis and frequency along the y-axis using the appropriate scale. Plot all the midpoints (class marks) against the corresponding frequencies. Plot each midpoint on the horizontal axis of the graph. Connect the midpoints using line segments. Start at the first midpoint and draw a line to the second midpoint, then from the second to the third, and so on, until you reach the last midpoint. Solve the example step by step on the board and explain each step to them. Encourage students to ask questions if they have any confusion.

**Sum Up:** **(3min)**

Sum up the lecture by retelling about the polygon, frequency polygon and the steps to draw frequency polygon for the given data.

**Assessment:** **(5min)**

To assess students ask them to tell the steps to construct the frequency polygon.

**Homework:** **(2 min)**

Revise the class work

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 2

**Unit Name:** Data Management and Probability **Topic:** Frequency Polygon **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Construct frequency polygon.

**Resource Material:**

Chalk/Marker, White/Blackboard, graph/chart, Textbook page 195 – 197, paper slips

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Ask students: What is meant by the frequency polygon? Write the construction steps of frequency polygon. Take their responses and call a student to the front of the class and ask him/her to write all the construction points to create a frequency polygon. Instruct the rest of the class to check whether he /she is correct or not. Appreciate them for good work.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will learn to construct frequency polygon. Instruct them to open their textbook page 195 recall the steps to construct the frequency polygon as given in the worked example. Instruct students to read the statement of the Q6 of "Learning check 9.3" given at page 197 of their textbook and tell what is given and what we have to find. Take their responses and tell them that table is given and we have to construct the frequency polygon for the given data. Call a student to the front of the class and ask him/her to draw table and add two extra classes and find the class boundaries. Take his/her response and guide where needed. Ask the rest of the class to check and correct if needed. Then call another student randomly from the class and ask him/her to find the midpoints of the class interval and then construct frequency polygon. Take their responses and help them where needed and appreciate them for their active participation and good work.

| Class Interval | Frequency |
|---|---|
| 91-100 | 6 |
| 101-110 | 3 |
| 111-120 | 3 |
| 121-130 | 5 |
| 131-140 | 8 |

**Activity:**

Divide the class into small groups. Provide each group paper slip with a set of data and its corresponding frequency distribution and chart paper. Instruct students to work collaboratively to construct a frequency polygon. Circulate around the class to offer assistance, guidance, and clarification as needed. Once all groups have completed their work, have each group present their work to the class. Encourage students to explain their approach to constructing the frequency polygon and discuss any challenges they encountered. Facilitate a brief discussion about common problems that faces by each group.

**Sum Up:** **(3min)**

Sum up the lecture by recalling with students the steps of construction of polygon.

**Assessment:** **(5min)**

To assess students understanding through their ability to accurately construct a frequency polygon, participate in class discussions, and answer questions related to the lesson content.

**Homework:** **(2 min)**

Solve Q5, Q7 (for frequency polygon) and Q8 of "Learning check 9.3" given on pages 197 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 3

**Unit Name:** Data Management and Probability **Topic:** Probability **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Recall probability.

**Resource Material:**

Chalk/Marker, White/Blackboard, graph/chart, Textbook page 193 – 194 and 196.

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Ask students about their previous day homework. Begin the lesson by asking students: Do you know about probability? Take their responses and tell them that the chance to something happen is called the probability, in a game there is probability is win or lose the game, when we flip the coin there is probability of head or tail, or when we roll a dice we have probability 1, 2, 3, 4, 5 or 6.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will recall the concept of probability. Recall with students the probability and the terms related to probability that is experiment, outcomes, sample space and event. Tell them that the probability of an occurrence can be computed by simply dividing the number of positive or desired outcomes by the total number of possible outcomes. Discuss with students about probability and the use of probability in many of our daily life situations like predictions and forecasting about weather, in investment decisions, election results, sales forecasting, etc, and probability is also used in natural disaster like an earthquake, flood, storm, etc. will hit the country or any specific area in the country. All these and many other events around us need predictions and calculations involving chance and probability. Recall with students the difference between certain and impossible events. Tell them that as probability lies between 0 and 1. If the probability of an event is 0 or 0% chance to happening, then it is said to be an impossible event and if the probability of any event is 1 or 100% chance to happening, then it is said to be a certain event. Tell them more about equally likely event that when there is a 50% chance of an event, i.e., $\frac{1}{2}$ then the event is said to be equally likely. Ask students: what is the difference between more and less equally likely events? Take their responses and tell them that when the probability of an event is between and 1 and $\frac{1}{2}$, then it is more likely that the event will happen. Explain them if the probability of an event is between 0 and $\frac{1}{2}$, then it is less likely that the event will happen. Instruct students open their textbook page 198 and learn more about probability and encourage asking questions if they have any confusion.

**Activity:**

Divide the class into small groups. Instruct each group prepare card of questions related to certain, equally likely, more likely, less likely and impossible events. Then exchange their cards with other groups. Ask them to identify and categorize the questions and their parts on the cards. Instruct students to find the probability that are mention in the card. Encourage communication and collaboration within the group. Ask each group to share their findings. Appreciate them for the correct solutions.

**Sum Up:** **(3min)**

Sum up the lecture by recalling the concept of probability and explain the "Note to Remember" given at page 198 of their textbook.

**Assessment:** **(5min)**

To assess students' understanding ask different questions related to probability and its terms.

**Homework:** **(2 min)**

Revise the class work.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 4

**Unit Name:** Data Management and Probability **Topic:** Combined Events **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Define and identify combined events.

**Resource Material:**

Chalk/Marker, White/Blackboard, graph/chart, Textbook page 199 – 204

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah. Ask students: How are you? Encourage them to say, “Alhamdulillah”. Ask them about their previous day homework. Ask students: What is meant by probability? What is the difference between certain and impossible event? Define equally likely event. Take their responses and appreciate for their correct answers.

**Main Activities/Concept Building:** **(25 min)**

Tell the students today we will define and identify combined events. Ask students: Do you know about combined events? Take their responses and tell them that combined events in probability refer to situations where more than one event is involved. Explain them the probability of combined events can be calculated using different methods depending on the type of events. Tell them when two or more events are combined, their probability is calculated by associating the words “and” or “or.” The word “and” means that we are talking about the probability of only those outcomes that satisfy more than one event at the same time. Explain them the word “or” means that we are talking about the probability of any of the outcomes. Ask students: What is meant by mutually exclusive events? Take their responses and tell them that two or more events that cannot occur simultaneously are called mutually exclusive events. Tell them when tossing a coin, the event of getting heads or tails are mutually exclusive, as we cannot get heads and tails at the same time. Explain them the formula if the events are mutually exclusive as follows.

$P(A \text{ or } B) = P(A) + P(B) + P(A \cap B)$

Ask students: What is meant by independent events? Take their responses and tell them that if the occurrence or happening of one event doesn't affect the probability of another event, then these events are known as independent events. Tell them if we roll a single dice two times, the outcome of the first roll doesn't affect the outcome of the second roll, so these two events are independent events. Explain them the formula if the events are independent as follows.

$P(A \text{ and } B) = P(A \cap B) = P(A) \times P(B)$

Instruct students to open their textbook page 199 and 200 and learn more about combined events and probability of combined events. Instruct students to read the statement of the worked example 1 given at page 201 and tell what is given and what we have to find. Take their responses and tell them that a single dice is rolled and we have to find whether the following events are mutually exclusive or not. Then calculate the probability P(A and B) and P(A or B). Solve the example step by step on the board and explain them to each step. For more clarification, solve the worked example 2, 3, and 4 step by step on the board and explain to them each step. Encourage the students to ask questions if they have any confusion.

**Sum Up:** **(3min)**

Sum up the lecture by retelling about combined events and probability of combined events. Also explain the “Note to Remember” given at pages 199 - 201 of their textbook.

**Assessment:** **(5min)**

To assess students’ learning, ask them solve “Pause and Try” given at page 202 of their textbook.

**Homework:** **(2 min)**

Solve Q1 to Q7 of “Learning check 9.4” given on pages 203 and 204 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 5

**Unit Name:** Data Management and Probability **Topic:** Theoretical and Experimental Probability **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Differentiate between experimental and theoretical probability.

**Resource Material:**

Chalk/Marker, White/Blackboard, graph/chart, Textbook page 193 – 194 and 196.

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah. Ask students: How are you? Encourage them to say, "Alhamdulillah". Ask them about their previous day homework. Ask students: What is meant by probability of combined events? What is the difference between mutually exclusive and independent events? Take their responses and recall with them about these.

**Main Activities/Concept Building:** **(25 min)**

Tell students today we will learn about experimental and theoretical probability. Ask them: Do you know about theoretical probability? Take their responses and tell them that as we know that Probability means how likely something is to happen. It is a measure of the likelihood or possibility of an event. we can calculate the probability of an event occurring, denoted by P(E):

$$P(E) = \frac{\text{Number of favourable (desired) outcomes}}{\text{Total number of possible outcomes}}$$

Explain them this is the theoretical probability of an event. The theoretical probability of a single event is the ratio or comparison of favourable (desired) outcomes to the total number of possible outcomes. Instruct students to open their textbook page 204 and learn more about theoretical probability. Instruct students read the statement of the worked example 1 and tell what is given and what we have to find. Take their responses and tell them that we have to find the probability of getting 6 if a single dice is rolled. Solve the example step by step on the board and explain them to each step. For more clarification, solve the worked example 2 and explain to them each step. Now explain them we can estimate the probability of a simple event by carrying out experiments which is known as experimental probability. Tell them the experimental probability can be found using the following formula:

$$\text{Experimental probability of an event} = \frac{\text{Number of times an event occurs}}{\text{Total number of trials}}$$

Tell them about trial that is a single performance of an experiment. Instruct students to open their textbook page 205 and learn more about experimental probability. Instruct students read the statement of the worked example 1 and tell what is given and what we have to find. Take their responses and tell them that we have to find the probability of landing on blue colour if a spinner has 5 portions in different colours and spun by 40 times. Solve the example step by step on the board and explain them to each step. For more clarification, solve the worked example 2 step by step on the board and explain to them each step. Encourage the students to ask questions if they have any confusion.

**Sum Up:** **(3min)**

Sum up the lecture by retelling about the difference between theoretical and experimental probability. Also explain the "Note to Remember" given at pages 204 - 205 of their textbook.

**Assessment:** **(5min)**

To assess students' understanding by asking students what is the difference between theoretical and experimental probability and how we can calculate it.

**Homework:** **(2 min)**

Revise the class work

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 6

**Unit Name:** Data Management and Probability **Topic:** Theoretical and Experimental Probability **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Compare experimental and theoretical probability in simple events.

**Resource Material:**

Chalk/Marker, White/Blackboard, Textbook page 207 – 208

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(8 mins)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask students about their previous day homework. Ask students: what is the difference between theoretical and experimental probability? Take their responses and recall with them the difference between theoretical and experimental probability. Discuss real-life examples where probability is encountered, such as flipping a coin, rolling dice, or spinning a spinner etc. and we use theoretical and experimental probability.

**Main Activities/Concept Building:** **(22 min)**

Tell students today that we will compare experimental and theoretical probability in simple events. Recall key concepts and formulas for finding the theoretical and experimental probabilities. Instruct students to open their textbook page 207 and read the statement of the Q1 of the “Learning check 9.5”. Ask them to tell what is given and what we have to find. Then instruct them to solve these questions step by step in their notebook. Encourage discussion within the students, ensuring that all are actively participate in solving the problems. Walk around and check their work and help them where needed. After this instruct to solve the Q2 step by step in their notebook and explain each step. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Activity:**

Divide the class into small groups. Provide each group with a set of paper slips. Each slip represents outcomes of experimental probability of different events. Instruct groups to come forward and choose one slip and calculate the experimental probability for task. Then instruct students also find the theoretical probability of then given task. Walk around, monitor their working and guide them where needed. Gather all groups together for a discussion. Each group shares their experimental probability results and the challenges they faced. Compare the experimental and theoretical probabilities for each task.

**Sum Up:** **(3min)**

Sum up the lesson by recalling with students the difference between theoretical and experimental probabilities.

**Assessment:** **(5 min)**

To assess students ' learning ask them to solve Q3 of “learning check 9.5” given at page 208 of their textbook in their notebooks.

**Homework:** **(2 min)**

Solve Q4 of “Learning check 9.5” given at page 208 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 4 **Lesson Plan:** 7

**Unit Name:** Data Management and Probability **Topic:** Sum Up and Unit Check **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 9 by solving Q1-5 of Unit Check Exercise.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook pages 209 and 210.

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Tell students that they are going to revise all the concepts of the Unit “Data Management and Probability”.

Ask them the different questions that are related to “Data Management and Probability”.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Have students open page 209 and 210 of their textbooks. Ask them to solve Q1 to Q3 of “Unit Check 9”. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Sum Up:** **(3 min)**

Sum up the lesson by repeating the important points given in Sum-Up of the unit given at page 209.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Solve the Q4 and Q5 of “Unit Check 9” given at page 210 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 5 **Lesson Plan:** 1

**Unit Name:** Data Management and Probability **Topic:** Sum Up and Unit Check **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 9 by solving Q6-11 of Unit Check Exercise.

**Resource Material:**

Chalk/Marker, White/Blackboard, textbook pages 209 – 210

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Tell students that they are going to revise all the concepts of the Unit “Data Management and Probability”.

Ask them the different questions that are related to “Data Management and Probability”.

**Main Activities/Concept Building:** **(30 min)**

**Activity:**

Have students open page 210 of their textbooks. Ask them to solve Q6 to Q8 and Q10 of “Unit Check 9”. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Sum Up:** **(3 min)**

Sum up the lesson by repeating the important points given in Sum-Up of the unit given at page 209.

**Assessment:** **(0 min)**

N/A

**Homework:** **(2 min)**

Solve the Q9 and Q11 of “Unit Check 9” given at page 210 of their textbook.

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 5 **Lesson Plan:** 2

**Unit Name:** Data Management and Probability **Topic:** Sum Up and Unit Check **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concepts of Unit 9 by solving Q12-14 of Unit Check Exercise and by completing "work with math" activity

**Resource Material:**

Chalk/Marker, White/Blackboard, Dice, Coins, Spinners, Marbles, Buttons, Beads and Recording Sheet, textbook pages 210 – 211.

**Teaching & Learning Activities:**

**Opening Activities/Warm-up: (5 min)**

Say, "Assalaamu Alaikum" and start with the name of Allah.

Ask students: How are you? Encourage them to say, "Alhamdulillah".

Tell students that they are going to revise all the concepts of the Unit "Data Management and Probability".

Ask them the different questions that are related to "Data Management and Probability".

**Main Activities/Concept Building: (30 min)**

**Activity:**

Have students open pages 210 and 211 of their textbooks. Ask them to solve Q12 and Q13 of "Unit Check 9". Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Activity 2:**

Tell students today, we will be performing a math project (work with math).

Get students into groups. Tell them each group will be assigned a different experiment (like choosing marbles, spinning the spinner, tossing a coin, etc. Explain each group will perform their respective experiments about 40 to 50 times and record the results in a table. Instruct them to calculate the experimental probabilities of each event. Then calculate the theoretical probability of these events and compare them with the experimental probabilities. Walk around the class and appreciate them for the correct solutions. Guide them if required.

**Sum Up: (3 min)**

Sum up the lesson by repeating the important points of the whole unit "Data Management and Probability".

**Assessment: (0 min)**

N/A

**Homework: (2 min)**

Solve the Q14 of "Unit Check 9" given at page 211 of their textbook.

**Teacher's Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 5 **Lesson Plan:** 3

**Unit Name:** Surface Area and Volume **Topic:** Revision **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Surface Area and Volume”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Surface Area and Volume”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(32 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(3 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(0 min)**

N/A

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

## Worksheet

**Name: _____** **Date: _____**

1. **Ali is making a large snow globe for a winter festival. The sphere-shaped glass dome has a diameter of 20 cm. Calculate the volume of the snow globe.**

2. **Madiha is creating a decorative bowl shaped like a hemisphere. If the bowl has a radius of 15 cm, find the surface area of the hemisphere.**

3. **The pyramid has a square base with sides of length 10 m, and the slant height of the pyramid is 17 m. Find the surface area of a pyramid.**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 5 **Lesson Plan:** 4

**Unit Name:** Surface Area and Volume **Topic:** Revision **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Surface Area and Volume”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Surface Area and Volume”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(32 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(3 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(0 min)**

N/A

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

## Worksheet

**Name: _____** **Date: _____**

1. **Sadia has a square pyramid-shaped jewelry box. The base of the pyramid is a square with sides of length 4 cm, and the height of the pyramid is 6 cm. What is the volume of the jewelry box?**

2. **A traffic cone has a base radius of 5 m, and its slant height is 8 m. Find the surface area and volume of the traffic cone.**

3. **A cone has a volume of 150 $cm^3$ and a height of 9 cm. Find its base radius and surface area.**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 5 **Lesson Plan:** 5

**Unit Name:** Data Management and Probability **Topic:** Revision **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Data Management and Probability”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Data Management and Probability”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(32 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(3 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(0 min)**

N/A

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

## Worksheet

**Name: _____** **Date: _____**

1. **Differentiate between discrete and continuous data and write two examples of each.**

2. **The scores of a group of students on a math test are as follows: 85, 90, 92, 88, 85. Find:**

   a) **Range** **b) Variance** **c)Standard Deviation**

**3. Draw a histogram for the data values:**

68, 72, 90, 85, 78, 92, 88, 75, 82, 95, 68, 72, 85, 90, 78, 92, 75, 82, 95, 88

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 5 **Lesson Plan:** 6

**Unit Name:** Data Management and Probability **Topic:** Revision **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Data Management and Probability”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Data Management and Probability”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(32 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(3 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(0 min)**

N/A

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

## Worksheet

**Name: _____** **Date: _____**

1. **Construct a frequency polygon for the given data:**

| Class Interval | 2 – 7 | 8 – 13 | 14 – 19 | 20 – 25 | 26 – 31 | 32 – 37 |
|---|---|---|---|---|---|---|
| Frequency | 2 | 7 | 10 | 8 | 9 | 4 |

2. **A fair six-sided die is rolled. Find the probability of rolling prime numbers.**

**3. A bag contains 5 red balls, 3 blue balls, and 2 green balls. Find the probability of a red ball if a ball is randomly selected from the bag.**

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

**Term: 3** **Periodic Unit: 2** **Week:** 5 **Lesson Plan:** 7

**Unit Name:** Data Management and Probability **Topic:** Revision **Date:**

**Objective(s):**

**At the end of this period, the students will be able to:**

Revise the concept of the unit “Data Management and Probability”.

**Resource Material:**

Chalk/Marker, White/Blackboard, Worksheet

**Teaching & Learning Activities:**

**Opening Activities/Warm-up:** **(5 min)**

Say, “Assalaamu Alaikum” and start with the name of Allah.

Ask students: How are you? Encourage them to say, “Alhamdulillah”.

Ask them a few questions related to the concept of unit “Data Management and Probability”.

Tell students that they are going to revise and practice the main concepts of the Unit by solving a worksheet.

**Main Activities/Concept Building:** **(32 min)**

**Activity:**

Give the worksheet to students. Instruct them to complete it. Roam around the class, check their work and guide them if needed.

**Sum Up:** **(3 min)**

Based on the worksheets solved by students, retell the basic concepts and correct the common mistakes.

**Assessment:** **(0 min)**

N/A

**Homework:** **(0 min)**

N/A

**Teacher’s Self-Evaluation:**

**Target:** Achieved ☐ Not Achieved ☐ Partially Achieved ☐

**Reason/Comments:**

_____

_____

| Type | Series | Subject | Grade | Teacher | Time |
|---|---|---|---|---|---|
| Lesson Planners | SUN (SNC ) | Mathematics | 8 | | 40 Min |

## Worksheet

**Name: _____** **Date: _____**

1. **A box contains 5 red, 7 green and 8 black balls. If one ball is drawn at random, find the probability of drawing either a red ball or a green ball.**

2. **Two fair six-sided dice are rolled. Find the probability of getting a 4 on the first die and a 5 on the second die.**

**3. Ali performed an experiment. He had a bag of marbles containing 4 red, 3 yellow, 5 blue and 6 green marbles. He picked one marble at a time without looking into the bag and recorded the outcome. He put the marble back and in the same way, he repeated this experiment and recorded the results in a table.**

| **Outcome** | Red | Yellow | Blue | Green |
|---|---|---|---|---|
| **Frequency** | 6 | 8 | 12 | 4 |